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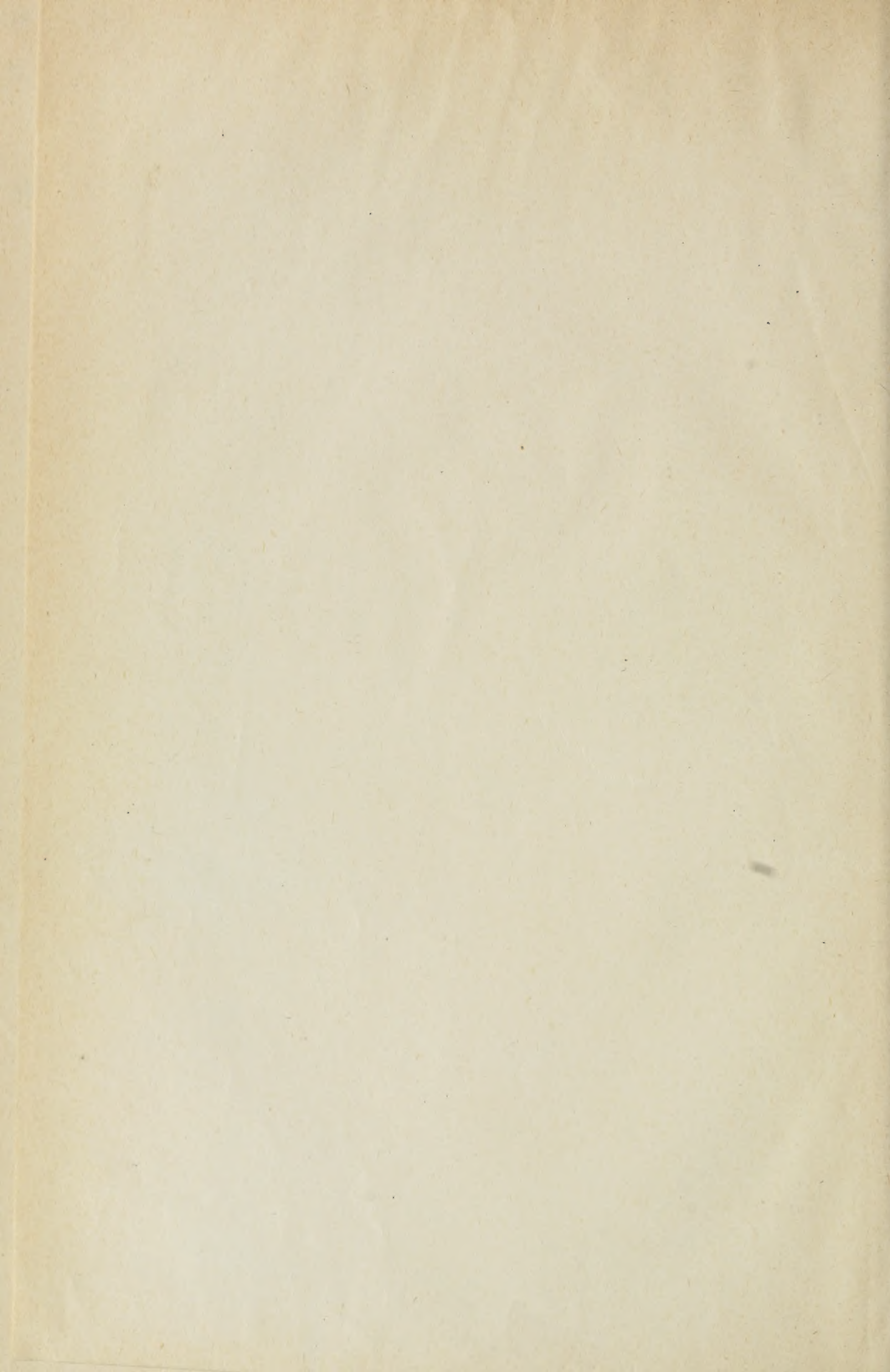
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Eighth Report
OF THE
Bureau of
AGRICULTURE, LABOR
AND INDUSTRY
OF THE
State of Montana



FOR THE YEAR ENDING NOVEMBER 30
1902

J. A. FERGUSON, Commissioner
L. P. BENEDICT, Chief Clerk

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HELENA, MONTANA



STATE OF MONTANA.
BUREAU OF AGRICULTURE, LABOR AND INDUSTRY.

Helena, Montana, December 1, 1902.

To His Excellency, JOSEPH K. TOOLE,
Governor of Montana.

Sir:—I have the honor to present you herewith the Eighth Report of the Bureau of Agriculture, Labor and Industry of the State of Montana, the same being the Second Biennial Report of the Bureau. I am,

Very respectfully,

J. A. FERGUSON,
Commissioner.

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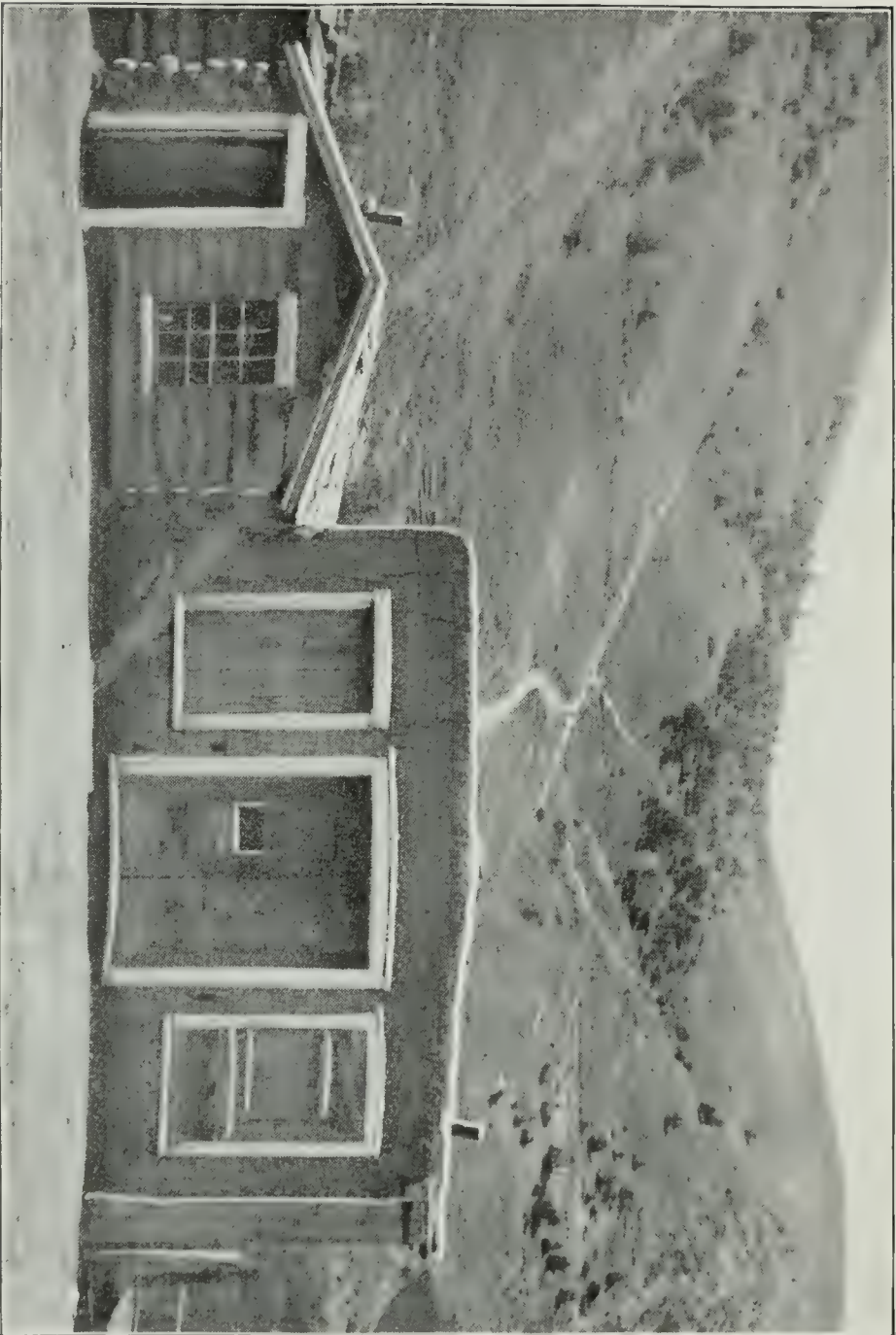
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HOME OF THE FIRST MONTANA LEGISLATURE
Convened at Bannack, December 12, 1864

Introductory.

The magnitude and diversity of the natural resources of this great State; the opportunities for the acquisition of comfortable homes and profitable investment are known to comparatively few people outside its borders. It is clearly within the bounds of propriety for the people of any community to disseminate accurate knowledge of its advantages and invite immigration and this was one of the purposes in the origin of this Department when the Act creating the Bureau was signed by Governor Rickards, February 17, 1893. While the immigration feature was dispensed with by the Fifth Assembly, it must be said that a large portion of the time of the office has always been given to it, nevertheless, by reason of the continually increasing number of inquiries that are received asking information relative to the opportunities for intending settlers and investors. Notwithstanding that the law does not impose upon this office the duty of answering such inquiries, the Commissioner has invariably given this class of correspondents such information as he possessed or could procure. Through these communications and the circulation of the report it can safely be said that many settlers and thousands of dollars have been brought into the State. It has occasionally happened that direct knowledge of these acquisitions has come to the notice of the Bureau, but no effort has been made to discover them and, of course, it is merely by accident that the results of this part of the Bureau's assumed duty is known. This department of the work had been so thoroughly installed prior to the repeal of the first law that it is about as easy to make appropriate reply to such inquirers as to go into a courteous explanation of the facts as they are, and, unquestionably, it is to the welfare of the State that some officer should cheerfully respond to requirements in this particular. Recognizing the good that accrues to the Commonwealth from this department of the work, the Commissioner has cheerfully devoted not less than one-half of his letter-writing time to home-seekers and investors. Those who, from interested motives, seek to bring settlers to a new country are not lacking and, therefore, the publication of actual conditions under State authority, as has been customary, is, from the standpoint of substantial advancement, invaluable to both the home-seeker and the Commonwealth alike. The fact of the widespread interest in the former publications of the Bureau; that each of the last two editions of the report were exhausted within some three months after their issuance; that more than one-half of the present edition is already spoken for; that it is to be found upon the desks of professional and business men who freely commend its adaptability to their needs and that it is asked for by every class of citizen in the State, would seem to be an emphatic endorsement of the wisdom of those whose interest in the growth and advancement of Montana created the Bureau. As the correspondence of the office will show, the report is in demand from public and private libraries all over the world; schools, colleges, universities, business men's associations, bankers, investors and home-seekers, reading rooms and workingmen associated and individually.

Restricted to a biennial publication, as it is, the work is bulky. It is

also expensive to circulate as compared with what it would be if published in bulletin form quarterly thereby admitting it to the mails as second-class matter and in a large percentage of instances one or two of the bulletins might be mailed instead of the whole book. Usually inquiries received from outside the State are in the form of a request for specific information that is limited to agriculture, labor or the industries, as the case may be, or a subdivision of one of these, and the balance of the volume is practically wasted in the hands of such an applicant. Again, the publication of so bulky a volume at a time when all the reports of State officers are in the hands of a single printer, is detrimental to the appearance of the book as, in the unavoidable haste it is out of the question to give the arrangement of the matter and proof reading the attention that such a work demands. This fact alone will fully account for the shortcomings of this report in these respects. It has been printed under all the disadvantages that can accrue from haste and lack of facilities.

The passage of the National Irrigation Act completely changed the style of treatment of the irrigation problem, it being no longer necessary to urge this vital subject to the attention of Congress on behalf of the thousands who are only awaiting an opportunity to possess themselves of such a home as rarely can be supplied outside our State. The Commissioner is indebted to Mr. Elwood Mead, Director S. Fortier and Mr. I. D. O'Donnell for valuable assistance on this chapter.

A severe disappointment is felt at not being able to collect accurate statistics relating to the production of the small grains in the State. A great deal of work was put upon this feature only to discover at the last that the figures were all too imperfect to justify their publication. It is apparent that a personal canvass of the farms of the State would involve a force of agents equal to that of a census-taking and this, under present conditions, is not to be thought of. Repeated circularizing, supplemented by personal letters, has so far proven a failure. However, it is pleasant to record the bountiful individual yields of crops in localities that will give a good general idea of the immense possibilities in this line.

In the Live Stock department will be found a compilation of specific detail relating to cattle and sheep that it is confidently believed will serve that interest most faithfully. The assessed valuation of these as also of horses and swine together with some remarks may also enlighten as to the status of this industry. The opportunity for raising angora goats at handsome profit and the contention of the special adaptability of Montana conditions to the extensive propagation of these animals is not in the least overdrawn. It is firmly believed that there is no broader field for lucrative investment and the extent to which the opening is being taken advantage of within the past year is worthy of notice, nineteen counties now having flocks of angoras as compared with two, two years ago.

It will no doubt be a source of gratification to those directly interested in the trades union movement to note that the number of unions represented in the Directory of Labor Organizations is about treble that of two years ago, and it may be said that still there were a few unions from which returns were not received. In accordance with resolutions that have been passed during the last two years in the most prominent bodies of labor organizations

in the West a discussion from the point of view of the workingman is indulged in and figures showing his production and his pay, or the share that he receives, are given. An account of every strike and lock-out is briefly recorded purely from the standpoint of fact. Extracts from letters of employees giving expression to their views as to the effect of the eight-hour day are worthy of consideration. Special features of this department are cited to be the extracts from letters received from men working in the lumber camps of the State; the report of the specialists in the matter of the so-called "Spotted Fever" plague; the Fellow Servant law; the Mongolian situation including an extract from the report of a San Francisco grand jury upon the diabolisms practiced by the Chinese in that city and which were proven to have been imported into Montana as well, and the report of the Free Public Employment Office at Butte.

Slowly but steadily the vast natural resources of Montana are developing available wealth through her productive industries. Her rich deposits of minerals have made the mining and smelting of ore the chief wealth-yielders of the State, and while these branches of industry are doubtless destined to remain at the head of the list for many years to come, it does not indicate that the others are lagging; but is rather due to the seeming profligacy of Mother Nature who has been captured, wooed and won by Labor and the finest intelligence and technical skill in the land. The special features of the mining department that have been compiled for handy reference for those engaged in the industry are the pages that are devoted to the geology of the sapphire and coal fields, written by expert geologists in the employ of the United States Geological Survey, and the not less instructive synopsis of the Mining Laws of the United States which was originally prepared by John B. Clayberg, Esq., an eminent mining lawyer, first delivered before the students of the Ann Arbor Law School and later given to the students at the School of Mines, Butte. These, the Commissioner has repeatedly been assured, will serve lawyer and layman alike.

The statistics of the Breweries, Saw Mills, Coal, Brick and Stone are presented with a feeling of pride at the painstaking work that has been put into their collection, tabulation and analyses. Throughout the statistical department where results of original investigation are chronicled in figures the reader is assured that extreme care has been expended upon them. Where they have originated with other sources reference is given or the figures have been verified. In addition to this an intimation or statement as to the source and methods of collecting the data is usually given in order to assist intelligent deduction.

It is felt that the time and labor devoted to the New Industries was well spent. Nothing of this character has ever participated in the report before and the liberal quotations which have been made from advance sheets by the press of the State is sufficient evidence of the estimate in which this record is held in connection with the development of our resources. This chapter has all been carefully prepared from personal investigation in conjunction with those to whom due credit is given. While the pages devoted to this subject convey information at the present, they will take on a more valued utility in the form of history in the years to come.

The chapter on Municipal Ownership is also a field heretofore untouched.

The data of this investigation are already being used by other cities of the State in the advocacy of municipal ownership. This of itself demonstrates that the pages devoted to this record are being put to immediate practical use and, therefore, the work of gathering the facts and their publication justified.

The social status of the convicts in the penitentiary is a new theme of investigation and its results are confessed to be a surprise in respects. With the exception of two items the undertaking was quite satisfactory. The religion and politics are believed to have been untruthfully represented in a number of cases. Even among convicts there is a sacredness that attaches to religious environment of childhood that it was apparent quite a large number sought to shield from shame. This accounts for a considerable percentage of the 148 who answered "None." In the matter of political affiliation it was often discovered in the course of the investigation that a convict cherished an unwarranted fear in the statement of his politics lest it might prove an impediment in the way of hoped-for clemency, commutation of sentence or pardon. This will account for nearly all of the 180 who have no politics.

In the record of Building Improvements will be found a reflection of the State's great prosperity and advancement during the past two years. This is also an innovation in the pages of the report which would seem to be justified by the impressive results adduced.

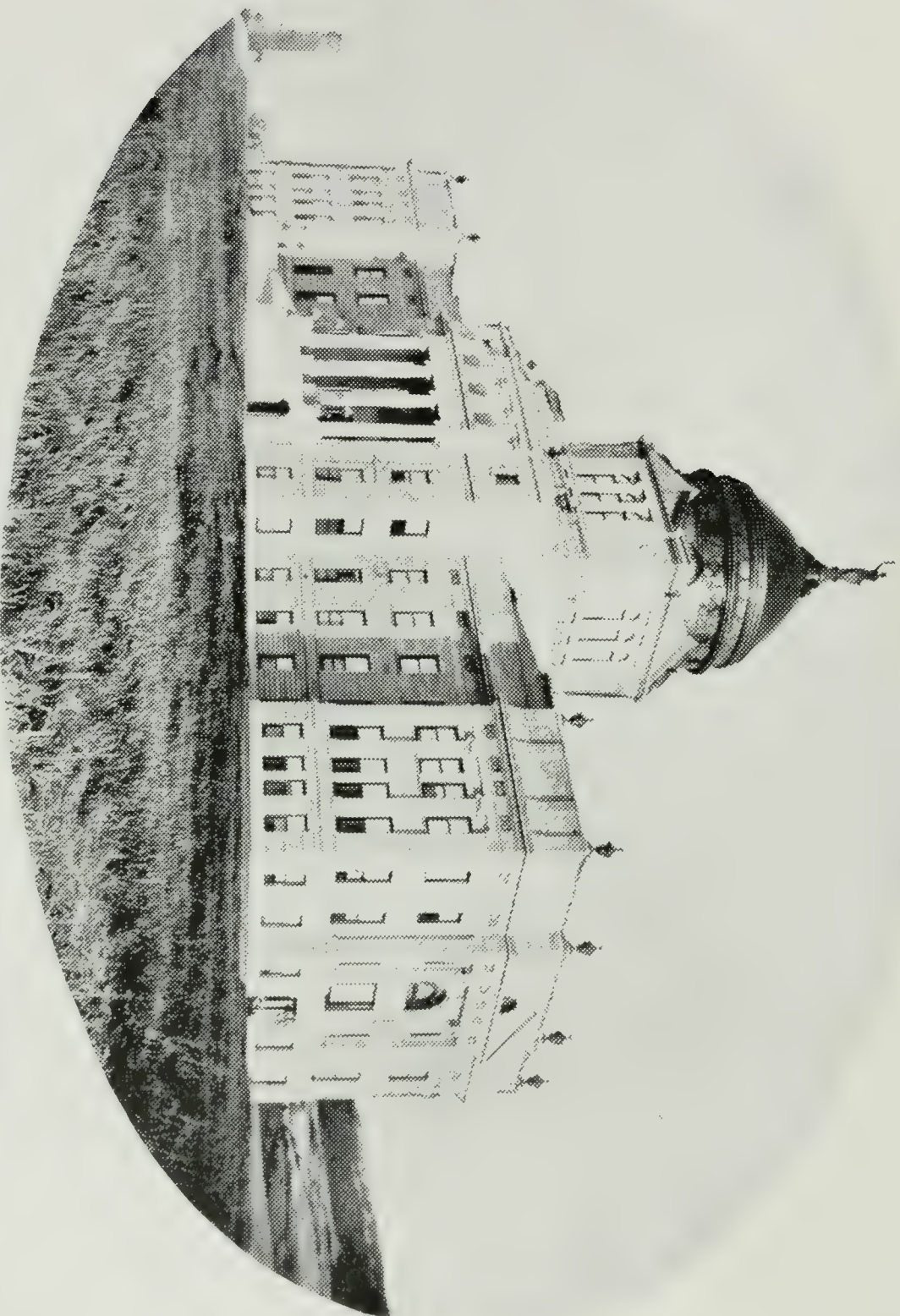
There is no statistical office in the State, this excepted, and upon scrutiny, it will appear that the title of the Bureau implies the widest possible scope of statistical activity with ramifications that sometimes carries operations into nooks and corners. In addition to being an office of research and original investigation its compilations are oftentimes quite as important. The tables taken from advance pages of the Twelfth Census are susceptible to a diversity of dissection and reconstruction that will yield information which would cost the State an impossible sum. Their reproduction herein places very much that is of sterling value at fingers ends for reference that would otherwise be lost to nearly all on account of the extremely limited circulation of the Census reports. If the liberal quotations from the Census seem a redundancy to some the justification for their reproduction will be found in the foregoing view. The Commissioner begs to assure such that much study and consideration were given these before they found their way into this report.

In conducting the affairs of the Bureau during the past two years the Commissioner has been able to keep within the appropriation made for its maintenance and has on hand a sufficient number of postage stamps to distribute this report.

In conclusion I desire to return expressions of profoundest gratitude to the many persons whose co-operation, cheerfully rendered, has made this work possible and to assure them of my personal appreciation of their uniform kindness. In addition to the illustrations that were prepared directly for the Bureau, special acknowledgment is due the Fergus County Argus for some of the best that appear in the volume; also to the Inter-Mountain and Miner of Butte, and the Anaconda Standard, the managers of which papers were unstinting in their courtesies.

I also desire that recognition should be accorded Mr. L. P. Benedict, Chief Clerk of the Bureau, whose diligence, efficiency and untiring devotion to duty has given added value to this volume.

J. A. FERGUSON,
Commissioner.



HOME OF THE EIGHTH MONTANA LEGISLATURE UNDER STATEHOOD

Convened at Helena, January 5, 1903

MONTANA.

From the days of the Louisiana Purchase; of buffaloes, savage beasts and still more savage Indians; from the primeval forests and unexplored rivers, plains and gigantic mountains to Montana, as it is known to-day, is a wonderful pilgrimage fraught with untold hardships, heart-breaking disappointments and heroic struggles. In the present-day peaceful security from frontier dangers, and absorbed in the accumulation of material things for the sake of personal aggrandizement, the great majority of people are too apt to overlook not alone the conditions which prevailed during the so-called "early days," but the highest and noblest ultimate development which should be the aim and object of all progressive efforts.

Rendered habitable and secure through the sacrifice of the pioneers; her mountains stored with countless treasures by the Omnipotent; forest, stream and plain vieing with each other in their willingness to yield their wealth to labor; blest with a matchless northern climate and embracing in its vast expanse of territory a bewildering variety of opportunity for successful enterprise, Montana stands to-day unmatched in rapid development, pre-eminent in golden promise, and unparalleled in the inducements she is able to offer to those with the nerve, brains and capital necessary to success. The foundation has been laid broad and deep; the superstructure now being raised is massive and substantial and future years will witness the completion and adornment of the noble work, made glorious and lasting by the efforts of a prosperous and contented people enjoying the fruits of their toil amid the countless blessings of this great commonwealth.

The first knowledge of Montana, obtained by white men, was when it was embraced in that vast region whose boundaries were the Arctic waters of Hudson's Bay, the Pacific Ocean, the Gulf of Mexico and the eastern tributary streams of the Missouri river, and claimed as a possession of France. The first explorations are believed to have been made by Verendrye, a French explorer who reached the main range of the Rocky Mountains at the Gate of the Mountains in 1743. By France the whole territory was ceded to Spain along with Louisiana in 1764. In 1800 the province again passed to France by treaty, and in 1803 the Louisiana grant, embracing a large part of what is now Montana, was ceded by France to the United States for a consideration of \$15,000,000.00, which event is to be commemorated by a great World's Fair in the City of St. Louis during the summer of 1904. Montana was formerly included in Idaho, and was constituted as a territory May 26, 1864. In 1873 it received an addition of about 2,000 square miles from Dakota. With the exception of the southern townships of Beaverhead, Madison and Gallatin counties south of latitude 45 N., the State lies north of that line and extends

to latitude 49 N., the international boundary. Her eastern limit is a point west of longitude 104 W., and the western limit is a point east of longitude 116 W., a territory embracing 146,080 square miles. This area is more than three times that of New York, two and one-half times that of the six New England States, one hundred and ten times that of Rhode Island. Included in the State is the main range of the Rocky Mountains, running north and south, and numerous subordinate spurs, as well as detached ranges whose peaks often surpass in altitude those of the main range. Among these spurs may be mentioned the Coeur d'Alene and Bitter Root Mountains, marking the dividing line between Montana and Idaho on the west, between which and the main range lie the fertile valleys of Deer Lodge, Ravalli, Missoula and Flathead, by many people thought to be the most delightful part of the State. The Belt and Judith mountains lie in the Northern center, separating the Musselshell on the northeast and Choteau on the northwest from Meagher County on the south, and extending to the Missouri River; the Bear Paw and Little Rockies still to the north; the Big Horn Mountains in the southeast part of the State and the western spurs of the Wind River Mountains on the extreme eastern border, with lesser ranges along the southern border. The main range of the Rocky Mountains, together with its spurs and valleys, occupies about one-third of the whole area of the State. The eastern two-thirds consists of rolling plains and detached mountain ranges, affording sustenance for the great herds of cattle and sheep, as well as embracing in the minor valleys and on the bench lands some of the finest agricultural opportunities in the world. As its name implies, Montana is a land of hills, valleys and mountains. Of its approximate 94,000,000 acres of land 26,000,000 are classed as mountain lands, 30,000,000 as farming lands and 38,000,000 as grazing lands. The main range of the Rocky Mountains has an average width of 180 miles and the peaks vary from 6,000 to 12,000 feet above the sea level. The distance from east to west across the State varies from 460 miles to 540 miles and north and south is about 275 miles. The mighty Missouri flows for nearly one thousand miles on Montana soil, and the Yellowstone, navigable for 450 miles, lies wholly within its borders. In the valleys of the western slope gather the waters that unite to form the great Columbia river. Other streams of importance are the Flathead, Missoula, Big Blackfoot, Bitter Root, Sun, Milk, Marias, Jefferson, Madison and Gallatin. These furnish abundant water for irrigation and for the development of water power, some of which has already been utilized to a remarkable degree by the installation of gigantic electric power plants, the most prominent being those on the Missouri at Great Falls in Cascade County and at Canyon Ferry in Lewis and Clarke County. There are also extensive plants on the Big Fork of the Flathead and on the Big Hole and Madison rivers. The population as given by the 12th census for 1900 was 243,329. From a careful estimate based upon the school census and the list of registered voters the present population is placed at not less than 265,000. For such an enormous territory the railroad facilities are good, and are being constantly improved.

The nightmare of over-production has never disturbed the people of

Montana. Outside of a surfeit of labor in the trades and clerkships there has never been such a thing as overcrowding of wealth producers in any direction. We have the largest per capita of wealth production of any state in the Union with one exception. Cities are growing with astonishing rapidity, at the same time there is not the semblance of a boom anywhere. Railroads are doing the largest business in their history and conditions in all lines are apparently satisfactory. Land is rapidly rising in value and thousands of acres are changing hands daily. Montana lumber has recently invaded the eastern markets and meets with ready sale. The farmers have had abundant harvests and the stockmen are realizing banner prices for cattle. The wool crop of the past season was the greatest ever known and brought a good price, and while copper is lower than for some years before the total mineral output for the year last past has exceeded \$60,000,000.

There is a wide range of climate in Montana. Undoubtedly the most desirable portion of the state for permanent residence is west of the main range of the Rocky Mountains in Missoula, Flathead and Ravalli counties. The chinook winds are prevalent and while there are severe storms and heavy snows during the winter the temperature generally speaking, is mild and the winters open; so much so that in various parts of the state the months of January and February are almost always devoted to plowing by the farmers. The western portion is celebrated for its wonderful fruit and grain and giant forests of pine, fir and tamarack which yield by far the largest part of all the lumber produced in the state. East of the mountains the temperature varies with the elevation. On the great stock ranges it is very warm in the summer while the fierce winds and driving snow storms render them disagreeable at times in the winter. It is very seldom so bad, however, that any great amount of stock is lost. It is in pleasant, sheltered valleys that Montana climate is found at its best. Tempered from wind, dry and rarified by elevation, pure and free from contamination, invigorating as old wine, it clears the brain, stimulates the energy and wakes into life all the dormant powers of man; encourages him to renewed effort and makes life worth living. Montana ought to be one vast health resort; will be when its qualifications are known. There is no malaria; no hot nights; humidity is never reported by the weather bureau. With the exception of overcoats many people gown themselves the same the year around. January and February are often as delightful as any of the months in the year. The extreme dryness of the atmosphere makes even the very lowest temperature less severe than a much higher degree in the east. The most disagreeable part of the year is always during the spring rain-time, but as these are necessary for the ranges and to provide sufficient water for placer mining and other purposes, they are rightly considered a blessing and welcomed as such. There is a great surprise in store for those who base their conception of Montana climate on the weather reports issued in former years from the government stations in Ft. Buford and Ft. Assinniboine if they ever visit the State. Buford having been determined by the late surveys to be in North Dakota, does not count, while Assinniboine in the extreme northern portion, unprotected by any range of mountains and occupying only a very small territory of the state, should not be considered as representative of climatic

conditions. Montana is not tropical. It forms part of the northern boundary of the United States. Hundreds of its mountains are covered with snow during the entire year, but at such places the only industry that would be carried on, if any at all, would be that of mining which is indifferent to the weather. Occasionally an early frost may injure a garden or an orchard, but there is no record of total loss of crops in any part of the state from unseasonable weather. The statement that for salubrity and healthfulness of climate Montana excels any northern state is wholly justifiable and personal investigation of its truthfulness is cordially invited.

Montana spends 25.3 cents a day upon each child in school and this is only exceeded by two other states in the Union. The various institutions.



BREAKING CAMP.

state and local, are a source of great pride, and from at least one of the high schools in the state pupils are admitted to the Stanford University without further preparation. The system of public schools is up to date and the corps of teachers in all departments are the best that good salaries will secure. Churches of all denominations abound and are generously supported. There are many newspapers some four of which are prominent and popular throughout the whole northwest. The citizens are bright, energetic and progressive, typical westerners, ready to assist any legitimate enterprise, and the kindest, most agreeable friends and neighbors imaginable. Prices are high for some things as compared with certain sections of the east but Montana is proud of the distinction of being the only high priced state left. Her

people fear of all things the most, the introduction of the "penny" into everyday trade and the two-cent methods of east and south, and in many Montana communities they are absolutely tabooed.

The principal occupations are mining, the reduction of ores, stock raising, lumbering and agriculture. Many other branches of industry are successfully prosecuted and nearly every week witnesses the establishment of some new enterprise.

SOIL AND WATER.

Arrangements are being perfected by the United States Department of Agriculture to make a thorough investigation of the soil in the various states, and Montana will receive her share of the resultant benefits. In general in this State any locality that is arable in any degree will produce crops when water is applied. Nearly every variety is found in one place or another. The new comer is likely to be unfavorably impressed with the appearance of the ground, especially if uncultivated and at certain seasons of the year. Further investigation, however, will effectually remove all doubts as to its fertility, and leave the beholder amazed at the possibilities of such land properly cultivated and with an adequate water supply. There is some alkali land, but even this is now being successfully cropped, and the alkali is fast disappearing under cultivation. There is doubtless fewer pounds of commercial fertilizer used in Montana than in any state in the Union, and much land on the foothills and benches that was considered worthless a few years ago is now under cultivation. Montana is one of the best watered states of the Union. Her great rivers and the enormous snow fall in the mountains furnish water in abundance, but it is a lack of facilities for the conservation of the supply that has resulted in so large a part of the State appearing as semi-arid. It is nearly always June before the rains begin to melt the snow in the mountains, causing great freshets, while the sun has long before taken all the snow from the valleys and foothills. The water lost in the June floods is what will be stored in reservoirs under the National Irrigation project for use later in the season. It was the conditions that prevailed in early days that caused the belief to gain such wide-spread credence that people in Montana had nothing in the way of water for domestic purposes, except that which was so strongly impregnated with alkali as to be injurious to health. In the time when there was no other source of supply than alkali streams and buffalo wallows this was no doubt true, but to-day the cities and towns have utilized the sparkling, ice cold mountain streams for their water systems, and where underlying bodies have been tapped by drive-wells, they yield bounteously of water that is shown by analysis to be pure and wholesome beyond compare. No one need fear for their health or comfort here, so far as water is concerned. Combined with this, there are a large number of hot and cold medicinal springs, and while, as yet, no attempt has been made to place their waters upon the market for general use, there are several which supply local customers and the time will surely come when this will be an important industry. Many of the springs have gained a wide and well deserved reputation and are maintaining large hotels and baths with every convenience for the comfort of patients and resident physicians.

OPPORTUNITIES IN MONTANA.

In the consideration of this subject special care has been taken to include absolutely nothing in the nature of surmise or speculation. The solution of the great problem, "How to succeed in business," is found in the old rule: "Find a want that is not supplied and supply it," and in collecting the material for this chapter the controlling idea has been to find the wants that are not supplied by Montana products and bring them to the knowledge of people who will supply them through home industries. The field is a large one. Montana is not a manufacturing state. But very few of the commodities of life are produced here and a large percentage of the hay, grain, fruit and vegetables consumed are shipped in from other states. Lack of water is the only limit to the possibilities in agricultural pursuits and there is no limit at all to the openings in manufacturing enterprises. The success of every industry of this kind that has been backed by sufficient capital and business energy was speedy and sure. Montana people are loyal to home enterprises.

The people we need are those possessed of at least a few thousand dollars, or its equivalent in machinery, and the practical experience necessary for managing a plant when it is started. There is but little chance for employment except in mining, lumbering or farming, and laborers in the first two industries are always plentiful. There are no factory towns and we have our proportion of idle men at all times. We have all the workingmen we need, except in the matter of farm hands and domestic servants, but the field for small manufacturing plants without local competition and in the best priced markets in the world is practically unlimited.

In manufactured articles it is probable that more home-made lumber, brick, flour and beer is sold than in any other line, but these commodities, except brick, are all shipped in by carloads to supply the demand. Thousands of barrels of eastern beer are sold every year and in some parts of the state the different brands of North Dakota flour are the only ones offered for sale. The quality of the barley and wheat grown in the state being unsurpassed, irrigation extension will increase the acreage. The capacity of the breweries and flour mills will be enlarged and new ones erected until they will not only supply the home demand but will have output for Asiatic export. This result will be fully realized through increased irrigation under government supervision in a few years. Hundreds of carloads of sash, doors and blinds with other mill products are shipped to us every year. The various factories in the state are well managed and equipped for turning out this material but with present capacity are unable to supply the market. No house furniture of any description is made and only a few mattresses. Few brick of any description are shipped in, the home plants furnishing common, pressed and fire brick of all kinds. There is a great opening in one direction in this branch of industry, however, and that is in the manufacture of paving brick. Street paving in Montana cities is yet in its infancy, but there are many places where the subject has been agitated and it will be only a few years when a great deal of this work will be under way. As a result of the experience of many eastern cities there is no doubt that brick will be a favorite material

if there is a proper supply at satisfactory prices, which can readily be guaranteed by utilizing the slag from the smelters. This is an enterprise that is well worth investigation.

Thousands of cases of eggs and barrels of poultry of all kinds are brought into the state each year. Small broods of fowl do well in all localities and there are certain sections of the state where the business can be carried on on a large scale. The poultry in this state could be increased 2,000 per cent without overstocking the market and the business offers a splendid opening for profitable employment.

Dairying is in a shameful state of neglect. Only five small creameries to supply the wants of a quarter of a million people. Interest in this industry is increasing somewhat, but there are dozens of locations where a profitable creamery can be conducted. Capital to establish a good herd of dairy cows by the proprietor of the creamery would not be amiss, as the farmers are not acquainted with the profits of this method of handling milk. They are learning, however, and it will not be long until eastern creamery butter and cheese will be supplanted by home products. Millions of dollars worth of pork and pork products are imported each year which should all be raised here. It is a mistaken idea to think that corn is absolutely necessary to successfully raise pork and many of our farmers have proven it. Barley, peas, soy beans, speltz and alfalfa all of which grow here to perfection, will take the place of corn and the state's disgrace of being dependent upon others for this great staple can be easily removed. There are golden profits in abundance for new comers who engage in this business. The absence of anything in the nature of a packing house forces the sale of all live stock on foot and the loss in values in this direction is enormous. All of the cattle and sheep now sent alive to eastern markets should be killed and dressed in Montana, giving employment to many men, saving freights, by-products and increased values to our own people. The various associations of stockmen should take this matter up and press it to a successful conclusion. The opposition which would be offered by the beef trust should make them only the more determined for the growers are at the mercy of the eastern packers anyway, and will be forced sooner or later to take measures for their own protection. This is a glorious opportunity to add a magnificent industry to such as already exist and one which would inevitably add to Montana's population and wealth. Visionary as the Marquis de Mores' plan of a packing house located on the range was considered by some to be, and falling a victim to a trust as it did, the combined growers of the state can make a success where he failed and eastern dealers will be as glad to get dressed beef from Montana as they are now to get the range cattle. Let us sell nothing but finished products.

There are numerous locations where tanneries could be successfully operated. Not a pound of leather is made in the state and very few of the magnificent furs for which Montana is noted are cured here, they being for the most part sent east in the raw state. Thousands of hides are shipped out for which our people receive only a ridiculously small sum, but when these hides are returned in the shape of boots, shoes, harness and the like, the very highest prices are charged. Think of the vast difference in the price received

for a green hide and the price paid for the same hide in the shape of a harness. The loss in values in the transformation of the raw materials into the finished product is enormous. The prevailing system of parting with our raw materials at nominal prices and buying the finished articles at whatever price the manufacturer places upon them is wrong and must be changed. The future prosperity of the state depends largely upon whether or not this is done. Wholesale manufacture of clothing is confined to one plant in Helena. Home-made cigars are estimated to be about 20 per cent of those consumed. There are no hats, hose, gloves, underwear, house furnishings, very little mining and no farming machinery made in the state.

The logging operations and the isolated conditions of many mining and milling companies occasions a vast consumption of canned goods of all kinds. The small irrigated tracts under a high state of cultivation glut the markets at certain seasons for short periods with the produce necessary to supply canning factories, but strange to say, there is not an institution of this character in the state. There are splendid openings for canning factories in Flathead, Missoula, Ravalli, Yellowstone and other counties.

With a practically unlimited supply of suitable forest trees and thousands of tons of straw grown in different localities, not a single pound of paper of any kind is produced. This is an opportunity which must soon be taken advantage of. Coming into competition with the great paper trust it will require a large initial outlay but there is no doubt of the success of such an enterprise and it is believed that the people would support it against all outside competition.

The possibilities of woolen manufacture are so great that they are treated in a chapter alone.

Very little of the soap used in Montana is manufactured within her borders, there being but two small factories. This would be remedied by the establishment of the packing plants mentioned above and would give grand opportunities in this direction for men who understand the business. There is but one cracker factory in the state, though this is a large one and belongs to the trust, while practically the total supply of vinegar, pickles and such table necessities are imported. In fact the minor possibilities are so varied and numerous that enumeration is tedious.

Perhaps, however, the most neglected opportunity is found in the fact that although Montana furnishes 61 per cent of all the copper produced in the United States not a single pound of this vast production is turned into finished copper within the borders of the state. It is shipped out as raw material to be returned in the shape of manufactured articles used largely by the very companies that mined the ore and operated the smelters. This is an instance where a change of methods would be of the greatest benefit to our people. The difference in the price of copper at the smelter and the price of copper wire laid down in Montana is largely made up of transportation charges. The added values are irretrievably lost to the state and must represent an enormous sum. As the power to mine and smelt the ores is furnished through the but partially developed water power of the state, so the power to operate copper factories could be furnished as well. The in-

creased values of manufactured articles would be added to the wealth of the state, work furnished for hundreds of employees, factories and homes would have to be built and the markets would be increased. The business men would all feel the added stimulus. Values of all kinds of property would rise and an era of prosperity such as the state has never known would mark the establishment of these new enterprises.

There are also vast beds of marl, gypsum and like formations that would form the basis for a high grade of cement. This product, sold at the eastern factories at from 60 to 80 cents a barrel, is sold in Montana at from \$2.75 to \$5.00 and even more a barrel, the difference again being mainly made up



A FREIGHT TRAIN BETWEEN GREAT FALLS AND LEWISTOWN.

of transportation charges. The present large demand for cement for the construction of buildings of all kinds will be greatly augmented in a few years when work is commenced on the system of reservoirs for storing water for irrigation. The savings in using home-made cement would be enormous and the erection of plants for its manufacture would inevitably be profitable.

As to the opportunities for successful and highly profitable farming and the raising of fruit and garden truck, they are positively unlimited. The resources of Montana in these branches of industry are simply wonderful. Money is necessary to engage in such enterprises but land can be bought for a much less price than in the east, and ten to forty acres of irrigated land will yield returns, with proper cultivation, that will occasion amazement to the eastern farmer. We need the methods of those people who understand in-

tensive farming. The vast holdings that now produce nothing but hay should be cut into small but highly productive farms, owned by prosperous farmers whose toil will result in an enormously increased production of wealth to the blessing and advancement of the whole state.

Thus far in the consideration of this subject only casual mention has been made of the opportunities for electricity by development of our water power for the use of mining properties. There can be no doubt expressed in any quarter of the statement that notwithstanding the fact that Montana stands at the head of the mineral producing states, she is still in her infancy in this variety of wealth production. Only within a few years has there been any successful efforts made to treat the low grade ores that are so abundantly present throughout the state. In Alaska and in South Africa, as well as in parts of our own country, companies are successfully treating a class of ores that have been passed by here because no process was available for their profitable working. There are actually mountains of low grade ore in Montana with values running from \$2 to \$7 per ton that will in the near future be profitably treated under some of the already known methods or newly devised ones. The great Treadwell mine in Alaska is said to be paying dividends out of ore that only carries \$1.50 a ton in gold values. The gratifying results obtained in Fergus county and other localities with the cyanide process will surely lead to the establishment of similar plants in other places where there is plenty of water power and low grade ores, thus immensely increasing the output of the state. These are not available opportunities for poor men as the installation of such plants will require in most cases a large initial expenditure, profits depending more upon capacity to treat a large number of tons daily than upon high values in the ore. Of the many meritorious prospects now located it is not our purpose to speak. Montana has been wonderfully free from what is known as "wild catting" and is justly entitled to the good reputation which her properties enjoy.

The successful transmission of electrical power over long distances for use in mines and smelters shows what is possible in its use in industrial enterprises of all kinds. Many irrigation projects may be made feasible by harnessing the stream to generate electricity which in turn will operate pumps to elevate the water from the stream into storage reservoirs and at the same time furnish power for light and to the motors in factories. A combination of all these interests would make such an enterprise possible where singly no one would dare make the attempt.

Notwithstanding that there are vast deposits of iron at our doors all that has been mined to date has been used for fluxing purposes. This industry is very promising and blast furnaces located near these properties could not fail to be remunerative. Montana uses thousands of tons of iron and steel, all of which is tremendously increased in cost by transportation charges and most of which should be produced in our own blast furnaces and rolling mills.

The great question of the sugar supply should not be overlooked. The per capita consumption of this article in the United States is 65 pounds, or a total for Montana of 15,816,385 pounds which, at the low price of five and one-half cents per pound reaches a value of nearly \$870,000 a year. Considering

the results of sugar beet cultivation in the state and the fact that not a single grain of all the sugar consumed is made in Montana, it is submitted that here is an opportunity for a profitable crop for the farmers and a remunerative investment for capital.

There are not many openings for new mercantile establishments. Montana merchants are wide awake and progressive, covering their various districts in a most competent manner and carrying stocks of goods that would be a credit to any eastern city; but taken as a whole, it can be said without fear of contradiction that Montana offers more and better opportunities for the investment of money in mines, manufactures and farms than any other state in the Union. It is safer and more congenial than Klondike. There are no hazardous risks, no physical sufferings to be encountered in prospecting our mountains or otherwise investigating our resources. It is confidently expected that a few years will increase the population to a million souls; that thousands of acres of land will be covered with irrigating canals fed from storage reservoirs; the production of wealth per capita already the second greatest known, will be still further augmented by new enterprises. You are invited to join us and share in our prosperity. Montana is destined to be the greatest home state in the Union. There is a subtle something here that appeals to the citizen or only a few months residence that is absolutely irresistible. Coupled with this are conditions that make Montana's death rate one of the very lowest and a climate that is a revelation, as well as the grandest of opportunities for establishing a safe and profitable business. With national aid to irrigation the future of the state is assured. Her millions of acres of land will soon be taken up and an era of unparalleled prosperity will begin; mills and factories will spring into activity in response to the wants of the thousands of people living midway between the seaboard. The vast crops of grain will be transformed into food in mills run by electricity generated by our matchless water power; the mines will continue to empty their stream of wealth into the laps of fortunate stockholders; the wool from millions of sheep will be manufactured here; packing houses will handle the meat products of the farms and ranges at home and countless new industries will contribute to maintain Montana's proud position as the greatest state in the Union.

LANDS.

Throughout the United States there is a land hunger. Inquiries for vacant land, come from all parts of the country, and transfers of large and small tracts are of daily occurrence. Receipts of all descriptions in the various land offices, for the past year, were record breakers. Never before was there such a demand for land. There seems to be a general idea that if the present concentration of industrial enterprises is to be continued indefinitely, the safest place for a man and his family, is on his own land where he will be sure of an existence when the worst comes. It is absolutely certain, that the cheap lands in Montana will never be any cheaper, and that the time to obtain possession is now. The rise in value will be rapid and certain. The withdrawal of millions of acres by the government for forest reserves, and the purchase and lease of other millions by cattle and sheep men, is rapidly diminishing the available public domain. Each year, even each month it becomes more expensive and more difficult to obtain a holding, and the struggle to gain possession becomes more acute. There are three classes of vacant land in Montana. Government, the state lands, and the railroad grants, the first named being open for settlement under the government laws, the second to be obtained by purchase or lease, and the third by purchase only.

HOW TO GET GOVERNMENT LAND.

All business connected with government lands must be transacted through the local land offices of which there are seven in Montana. These are located at Bozeman, Gallatin Co.; Miles City, Custer Co.; at Lewistown, Fergus Co.; at Helena, Lewis and Clarke Co.; at Missoula, Missoula Co.; at Kalispell, Flathead Co.; and at Great Falls, Cascade County, the latter established August 1, 1902.

Communications regarding public land may be addressed to any of these offices, and homestead affidavits can be made before the clerk of the District Court at any county seat, or before any United States Commissioner in the state, and the journey to the land office saved. There are a number different ways in which title to land may be obtained and a short description of each is given.

HOMESTEADING.

A homestead may be secured by any person who is the head of a family, or who has arrived at the age of 21 years, and is a citizen of the United States, or has declared his intention to become such; and who is not the proprietor of more than 160 acres of land in any state or territory. Such person is entitled to one-quarter section (160 acres), or less quantity of unappropriated public land, under the homestead laws.

The applicant must make affidavit that he is entitled to the privileges of the homestead act, and that the entry is made for his exclusive use and benefit, and for actual settlement and cultivation, and must pay the legal fee, and that part of the commissions required. The fee for filing upon 160 acres is \$10.00 and the commission is from \$4 to \$12.00; for 80 acres the fee is \$5.00 and the commission from \$2.00 to \$6.00. Within six months from date of entry the settler must take up his residence on the land, reside thereon and cultivate the same for five years continuously. At the expiration of this period, or within two years thereafter, proof of residence and cultivation must be established by four witnesses. The proof of settlement with the certificate of the Register of the land office, is forwarded to the General Land Office in Washington, from which patent is issued. Final proof cannot be made within five years from date of settlement and must be made within seven years. The government recognizes no sale of a homestead claim. After 14 months from date of entry the law allows the homesteader to secure title to the tract if so desired, by paying for it in cash, and making proof of settlement, residence and cultivation for that period. The law allows only one homestead privilege to any one person, but under act of March 2, 1889, Section 2 provides that in certain cases, when the first homestead was necessarily abandoned, a second filing may be made. An unmarried woman of age, can take the benefit of the homestead law. If she marries before she has acquired title, and continues her residence on her claim, she can proceed to prove up at the proper time the same as if she had remained single, but husband and wife cannot secure separate tracts by maintaining separate residences at the same time. All the sons and daughters of a family are entitled to take up land under the United States land laws. Soldiers who served in the army or navy during the war of the rebellion for more than 90 days, can obtain 160 acres of any of the public lands by filing (himself or by an attorney), a declaratory statement, and within six months thereafter filing his affidavit and application, commencing settlement and cultivation, and continuing the same for five years, less that time he served in the army or navy; but such time in no case to exceed four years. A soldier's widow has the same privilege. In case of his death in the army, or his discharge therefrom on account of wounds or disability incurred in the discharge of duty, the term of his enlistment is deducted. In case of the death of a soldier, his widow, if unmarried, or in case of her death or marriage, then his minor orphan children by a guardian duly appointed and officially credited at the Department of the Interior, shall be entitled to all the benefits given to soldiers under the homestead laws.

THE TIMBER AND STONE ACT.

Under this act, any citizen of the United States, or one who has declared his intention to become such, can acquire not to exceed 160 acres; land must be chiefly valuable for its timber and stone, containing no valuable deposits of gold, silver, copper, coal or cinnabar. The applicant is required to file an affidavit with the Register and Receiver of the land office that he has made no prior application; to designate the tract desired by legal subdivisions, setting forth its character as above, and that it is for the applicant's own

use and benefit. Such application will be published for sixty days, when the applicant files further proof of the character of the land, and upon payment of \$2.50 an acre receives the title. Married women can also receive the benefit of this act.

FOREST RESERVES.

Under an act of Congress approved March 3, 1891, which provides that: "The President of the United States may from time to time set apart and reserve, in any state or territory having public lands bearing forests, in any part of the public lands wholly or in part covered by timber or undergrowth whether of commercial value or not, as public reservations, and the president



A GREAT NORTHERN TRAIN CROSSING RAINBOW FALLS NEAR GREAT FALLS.

shall by proclamation declare the establishment of such reservations and the limits thereof." Seven such forest reserves have been established in Montana.

The following epitome of the general rules and regulations governing them was furnished by Senator Paris Gibson.

"The object of a forest reserve is to maintain forests on lands where they are needed, for two principal reasons: First, to furnish timber, a valuable and much needed product, from lands which are unfitted to produce a more

valuable crop, such as corn or wheat; second, to regulate the flow of water.

"Farmers on patented land are, of course, in full possession of their lands just as much as if the farmer were outside of the reserve.

"If land was settled upon prior to the location of the reserve, but is unsurveyed land, and a former claim is not filed in the United States land office, the settler may so file on the land when it is surveyed, but must do so within three months after the survey plats covering his land are filed in the local land office.

"Any person who purchases a farm which is not patented, a mere claim subsequent to the creation of the reserve, gains no rights whatever.

"Anyone settling on agricultural lands after the creation of the reserve commits trespass, and gains no rights by his settlement.

"Prospecting and mining in forest reserves is not prohibited or interfered with, and locations and entry of claims is allowed under the general mining laws of the United States, and the particular state or territory.

"The permit to construct, enlarge and repair roads and trails in reserves is granted only by the secretary of the interior, and never by rangers or other forest officers.

"Anyone wishing to construct a road or trail should make application to the secretary of the interior.

"Permits must be obtained for constructing railways, telegraph and telephone lines.

"School houses or churches may be erected on reserved lands, but the amount of land used for any one school or church site must not exceed two acres. The matter is simply a privilege, and the title to the land remains in the government.

"The secretary can grant the privilege of establishing hotels, road ranches, stores and other business enterprises in forest reserves.

"Application for permit to erect a saw mill on land within a forest reserve is made in the same form as for other privileges.

"All law-abiding people are permitted to travel in forest reserves for purposes of prospecting, surveying, to go to and from their own lands or claims, and for pleasure or recreation, but in every case the person or persons so traveling, camping, etc., must obey the rules established by the department for the forest reserves, and particularly will they be expected to refrain from doing anything that may result in injury to the forest.

"The secretary of the interior can forbid any and all kinds of grazing thereon.

"Whenever the grazing appears to do no marked damage to the forests of the reserve, grazing is allowed by the department, but until the department has decided that it will do no harm, and that a certain number of either sheep and goats, and cattle or horses may graze in a reserve or part of a reserve, the grazing of stock is prohibited.

"Cattle are generally allowed to graze in all reserves, and excluded only in cases where unfavorable conditions make the grazing undesirable. The few head of horses of prospectors and travelers are not considered in matters of grazing, and require no permit.

"All persons holding grazing permits pledge themselves to assist in protecting the reserve, and in preventing and fighting fires.

"All persons who violate any of the reserve rules or the terms of their applications, and permits, will be debarred from the use of the reserve.

"The free use of timber and stone is a privilege and not a right. It may be refused to any person. It is usually granted to settlers, farmers, prospectors and others residing within, or in the neighborhood, of the forest reserve. It is refused to corporations, companies, saw mill parties and owners of large establishments who require large quantities and are expected to purchase, and to non-residents of the state in which the reserve is located.

"Permits for an amount not exceeding \$20.00 in stumpage may be granted by the forest supervisor. Permits for a larger amount and within the stumpage value of \$100.00 are granted only by the secretary of the interior. The same person cannot apply oftener than once a year.

"A permit holds good for six months from the date of issue, or less time, in the discretion of the forest supervisor.

"All kinds of timber grown in the reserve can be obtained. Generally dry fire wood, dry poles and logs, also, if really needed, green timber, in which case application must be made to the forest supervisor. The timber may be taken if dry wood is applied for, and it must be measured either standing or in pile before being hauled away.

"Only the timber applied for can be cut; for instance, no green timber may be taken if dry wood is applied for, and it must be measured either standing or in pile before being hauled away.

"Wood and timber is to be used only at the place stated in the application. The use of it elsewhere, and especially the sale of it, makes the cutting a trespass, and the applicant becomes liable to suit, and is always debarred thereafter from the privilege of free use.

"The cutting of timber by a local mill is permissible, but the sawing must be paid for in cash, and cannot be done on shares. Moreover, the sawing and hauling of the lumber must be done in a manner required by the forest supervisor, and in such way as to enable him to determine whether or not the timber and lumber are really used in the place and manner promised in the application.

"A person trespasses in a forest reserve by cutting and removing timber without permit, and by cutting and disposing of more timber than is necessary to develop his mining claim."

The seven reserves are known as 1, The Lewis and Clarke; 2, The Flathead; 3, The Bitter Root; 4, The Gallatin; 5, The Madison; 6, The Little Belt; 7, The Absaroka, the three last named being the largest additions.

The Madison Reserve was created by proclamation on Aug. 16, 1902, and with the exception of about one township in Gallatin County, embraces most of the southern part of Madison County, and consists of about 800,000 acres. By it the heavy timber that covers the head waters of the Jefferson and Madison rivers, will be protected and the flow of water in those streams greatly conserved.

The Little Belt Mountain reserve was designated as such on the same day, and lies in the northeastern part of Meagher County, the southwestern part of Fergus County, and the southeastern corner of Cascade County. The town of Neihart and the Yogo sapphire mines are inside the reserve, which contains approximately 503,040 acres. On Sept. 4, 1902, the Absaroka reserve, embracing parts of the counties of Carbon, Park and Sweet Grass, and lying along the northern boundaries of Wyoming and the Yellowstone National Park, was also set aside by proclamation. This reserve protects the many streams that go to swell the volume of the Yellowstone river and contains 1,385,600 acres, making a total set aside as reserves during the year 1902 of 2,688,640 acres of land. The older reserves, having been printed upon recent maps, are much better known. Of them the largest is the Lewis and Clarke, made up of parts of Flathead, Teton, Powell, Missoula and Lewis and Clarke counties, and containing 4,572 square miles or 2,926,080 acres. The second in size is the Flathead reserve which is located in Teton

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FLORAL PARADE, HELENA, JULY 4, 1902

and Flathead counties, contains 2,160 square miles or 1,382,400 acres. The Bitter Root reserve is one of the largest in the northwest and contains altogether 6,480 square miles, but much the greater part of this lays in the State of Idaho, with only about 450,000 acres in Montana, all of which is in the western part of Ravalli County.

The Gallatin Reserve occupies parts of Park and Gallatin counties in the vicinity of Bozeman, and contains only 63 square miles, or 40,320 acres.

This makes a total in the old reserves of 4,798,800 acres and a grand total of all Government Forest Reserves in Montana of 7,487,400 acres. Nearly 11,700 square miles, or about 1-13 of the total land area of the state. These reserves are in charge of gentlemen appointed as Supervisors of Forest Reserves, who generally live upon or very near the particular reserve over which they have jurisdiction. During the summer months they maintain a corps of forest rangers, upon whom devolves the labor of general care of the reserve, particularly as regards the prevention of fires, and it is due to their watchfulness and care that few dangerous fires have ever occurred. They patrol the entire reserve on horseback, lay out trails, and watch for violations of the regulations. The pay of rangers is \$40.00 a month and rations.

SCRIPT.

With the inauguration of the policy of establishing forest reserves by the United States government, arose the problem of the status of land claims of the settlers whose locations were within the reserve, and who were compelled by law to relinquish those claims. It was decided to issue script, with which the settlers could obtain land in any other locality, but when it was further decided that such script was saleable and could, therefore, be used by any person in the selection of public lands, it at once assumed a commercial value, and was widely bought and sold, and it is still possible to obtain land with it, if the intending purchaser can pay the price demanded for the script.

THE DESERT LANDS.

The term "Desert Land" is applied to such areas as will not produce crops without an artificial supply of water, and to obtain title to such land under the desert land act, the person making entry at the government land office is required to make affidavit that the land will not, without artificial irrigation, produce an agricultural crop of any kind in paying quantity, and that it cannot be cultivated unless it is supplied with the necessary water. This affidavit must be supported by two witnesses whose testimony is also given under oath.

In making final proof the entryman must swear that water has been brought upon each legal subdivision, and crops have been successfully raised thereon, such statement being corroborated by the oaths of two witnesses. The law applies only to the state of California, Oregon, Nevada, Washington, Idaho, Montana, Wyoming, Utah, North and South Dakota, and in Arizona and New Mexico.

It is designed, of course, to expedite the reclamation of the arid land districts of these states, and to provide homes for actual settlers, but whether it has operated to that desirable end or whether it has been so manipulated as to act as a detriment in the actual settlement of these lands by individuals, and

simply entrenched the great cattle and sheep companies in their range holdings is open to question. If the latter is true, as claimed by Senator Gibson and others, there can be little doubt that the law is not productive of the best results, and should be repealed.

Senator Gibson's views upon the matter are clearly set forth in the subjoined article, and will repay careful study:

"As I have for a long time believed that the irrigable lands of our arid domain should be reclaimed by the national government, and that they should be so safe-guarded that when reclaimed they will furnish homes for millions of people, I am desirous that my views shall be clearly understood in this state.

"Montana embraces more than 146,000 square miles and possesses great agricultural, pastoral and mining resources. It has long been known as the best watered of all the arid states, three of the great continental rivers finding their source in its mountains. Notwithstanding all these resources, and the fact that it is traversed by four of the leading western railroads, its population, according to the last census, was but little more than 240,000. Of this population 185,000, at least, reside in our cities and villages, leaving not more than 55,000 people who make their homes in the country. Out of this rural population, it is my belief that three-quarters are engaged in various pursuits not connected with agriculture. Such being the case, we have to-day no more than 12,000 to 15,000 people employed in agricultural pursuits.

"It is a well known fact that during the past year the great tide of immigration that has steadily set westward, has not been turned into Montana. Thousands of immigrants have passed through our state, going over the Great Northern, Northern Pacific and Burlington railway lines, but I think it will be admitted that very few settlers have established their homes in Montana during the past year, although we have quite a large area of choice lands, especially in Northern Montana, where profitable farming is, and can be carried on without irrigation. During the last fiscal year there have been sold from the federal lands of our state 1,157,088 acres, netting the government more money than it has received from any other state excepting Oklahoma. This enormous acreage of land has been selected from the very choicest of the federal lands of our state. To one unacquainted with the conditions prevailing here in Montana, this great area of land acquired the past year would mean that our state has received a very large immigration of farm settlers. But as such is not the case, we are forced to the conclusion that the bulk of these lands has been taken up and paid for, not by new settlers and home-seekers, but by capitalists desiring to increase their already large holdings of land for pastoral purposes.

"The question should be brought home to every citizen of this state who is interested in its advancement: Are we to make Montana a permanently prosperous and populous state, or shall we quietly see it turned over to a few capitalists who will use it, not for agricultural purposes, but for maintaining extensive herds of cattle upon its native grasses. Shall Montana, like Nevada, be delivered over to a small number of men, or shall we now place the foundations here permanently for a great and prosperous state? Can any one doubt that in order to make our state great and permanently prosperous, as are all the states of the Union where agriculture is firmly established, we must see to it that its rich arid prairies and table lands are not only reclaimed, but occupied by homebuilders and producers of wealth from the soil. These irrigable lands of the arid west must not only be reclaimed, but the national government must adopt some system of land laws that will contribute in the greatest degree to their settlement. In my opinion, the time has arrived when the public domain should be held as far as possible for actual settlers and home builders. It will not do to delay the reservation of these federal

lands for several years to come, for, under the present rapid rate at which our best lands are being acquired, there will be little or nothing left for settlers after our lands shall have been reclaimed. In my opinion, there is but one way to preserve the public domain for settlement and that is by the repeal of the desert land act, and the stopping of the further issuing of scrip, thus making it possible to acquire land in no other way than by homesteading it. And this is not all. The homestead act should be deprived of any and all commutation provisions, thus making it obligatory upon the homesteader to establish an actual residence upon his land for five years. Unless a rigid system similar to that which I have indicated is adopted, all the choice irrigable lands out of the six hundred millions or more acres embraced in the public domain, will shortly pass into the control of men who will never cultivate them, except in rare instances, but who will use them for pastoral purposes.

"But some say: Withhold the federal lands from entry as fast as they are selected for irrigation by the national government and not faster. But if this suggestion is followed, no good lands will be left for settlers, for the capitalist, armed with the desert land act (which is used everywhere in Montana except upon school sections, mineral and timber land) will surely be in advance of the settler, and will take up for his own benefit, every acre of choice lands intended for reclamation. The government, in whatever it does, moves slowly, while the men who foresee its action will make haste to take advantage of it.

"It does not follow that the enormous acreage of choice lands of our state, taken up the past year, are owned now by all the entrymen that appear on the books of the federal land office as having taken these lands, for the chances are that a very great proportion was taken up for the benefit of large concerns and have already been transferred to them. As I stated they certainly have not generally been taken by men and women who desire to establish permanent homes and to cultivate the soil.

"If we, who live in the arid and semi-arid west, are sincere in our desire to see the farm lands of this country reclaimed and settled as thickly as are the lands of Michigan, Minnesota and Wisconsin, we must certainly desire to preserve such as are now left for the benefit of settlers.

"The desert land act, in my opinion, never was intended by those who framed it, to advance the settlement of any one of the arid states, and so long as it remains in force it will be simply a means of increasing the holdings of public lands by a few individuals and companies.

"Another reason why the desert land act should be repealed is that time has fully demonstrated that it is impossible to enforce its provisions. If there is any doubt on this point let him who desires to investigate, go over the desert land locations of Northern Montana and see if the provisions of the act have been complied with, except in rare cases.

"The reclamation of our arid lands and their settlement constitute a subject that should engage the attention, not only of the people of this state, but of every person in all states who desires the advancement of the whole country. Fortunately, the upbuilding of the west, embodied in these subjects, is not the issue of any political party, but its advocates are found in all parties. Here in Montana, especially, a plank hereafter should be placed in the platform of every county and state convention, whether held by democrats, republicans or populists, demanding national aid in the reclamation of the arid west. The Trans-Missouri country must furnish homes for much of the rapidly increasing population of our country, for, we should bear in mind that within thirty years, instead of 76,000,000 people, the United States will have a population of 135,000,000. Where will the surplus population of our country find homes during the next twenty-five years unless upon the prairies and table lands and valleys of the Rocky Mountain country? The

plain duty of the national government is now to provide homes for the people."

In making further investigations Senator Gibson found proof that instead of advancing the interests of the state by inducing settlement of 160 acre tracts with bona fide home builders, the law had resulted in the acquirement by one company in the Great Falls district of 30,000 acres of desert land, and there is no reason to suppose that this is an isolated case. This land is now devoted to use as a stock range, but if the spirit of the law had been complied with, might have been cut into small irrigated farms of 50 acres each, thus furnishing homes for 600 families with their resultant increase of population and production. It is true that the law will require the company to put water upon this land, should they ever wish to obtain



A MONTANA BANK.

title to it. But their evident purpose is simply to hold it for range, and thus effectually prevent its occupation as a valuable agricultural area. After all, as the Senator says, "The question is not: Are lands being fraudulently acquired under the desert land law, but do we want the lands when reclaimed to be thickly settled with farmers?" There can be but one answer to this question. The crying need of the people of this great country is the opportunity to earn their living by having access to the source of all natural wealth—the land; and the duty of our great state and her citizens is, to so manage our land as to induce the coming of as many home builders as possible, and to make the acquirement of a homestead as simple and profitable as possible.

The contention of the opponents of the desert land act, who claim that

it should be repealed for the reason that it allowed interested persons to secure to themselves large tracts of public lands to the detriment of the settlement of the same by actual homeseekers, would seem to have been fully substantiated by recent occurrences. In November, 1902, nearly 60,000 acres of such holdings in Montana, were thrown open to settlement by the government, upon the ground that the law had not been complied with.

Thousands of people to-day are looking for opportunities to secure homes in farming communities. When the conditions are satisfactory, there is no difficulty in securing desirable immigrants. No one wishes to destroy or hamper the great stock interests of Montana. They must, however, be prepared to meet the inevitable laws of change; indeed, they are even now doing so. The days of range cattle are numbered. The time is fast approaching when the great bands of stock will be broken up, but this will only result in a change of method, and the number of cattle in the state will be vastly increased thereby. It is our first duty to see that the land within our borders is reserved for the actual settler. Especially such land as is susceptible of irrigation. Under the desert land act, any citizen of the United States or persons who have declared their intentions to become such, and who are residents also of the state or territory in which the land sought is situated, may file a declaration under oath, with the Register and Receiver of the land office of the district in which any desert land is situated, that he intends to reclaim a tract of desert land not exceeding 320 acres by conducting water upon the same within four years. At the time of filing this declaration a fee of 25 cents for each acre of land proposed to be so reclaimed must be paid, and a description of the land, whether surveyed or not,—in the latter case describing the tract as nearly as possible—must also be filed. The applicant must also file a map of said land which shall exhibit a plan showing the mode of contemplated irrigation, and which plan shall be sufficient to thoroughly irrigate and reclaim said land and prepare it to raise ordinary agricultural crops and shall show the source of the water to be used for such purpose. At any time within four years, upon making satisfactory proof to the Register and Receiver of the actual reclamation of said land, and the expenditure thereon of \$1.00 an acre each year, for three years, and proof of the cultivation of one-eighth of the land, and upon the payment of the additional sum of one dollar an acre a patent shall be issued. A claimant must also file with the Register during each of said three years, proofs by the affidavits of two or more credible witnesses, that he has made such expenditures. He may, however, prove up earlier whenever he can make the required proof of reclamation, cultivation and expenditure to the aggregate of \$3.00 an acre. All lands, exclusive of timber and mineral lands which will not, without irrigation, produce some agricultural crop, are deemed desert lands. Residence on the land is not required.

LAND LEASING.

During a number of recent years an effort has been made by parties that were directly interested, among them the American Cattle Growers' Association, to secure the enactment of a law by the Congress of the United States, providing for the leasing of a large part of the public domain, for a long term of years, for grazing purposes. It was deemed a matter of great satisfac-

tion to the people of the western states when Congress adjourned without passing such a law, the opposition being based upon the belief that such action would retard the growth and development of the great western country by preventing its settlement by individual homeseekers on small farms, and it appears to be well founded. Stock raising is now of great value to this state. Millions of dollars worth are raised every year. It is not good policy, however, to "bite off the nose to spite the face." More cattle will be raised when Montana has 200,000 small farmers than were ever calculated upon under the open range system, to say nothing of the other farm products, and the consequently increased benefits to the state.

In the case of the state lands, the question presents a somewhat different aspect. It has been pointed out that the land leasing system adopted by the State Land Commissioners works to the disadvantage of the state, exactly as would the passage of the obnoxious law by Congress, but this is not entirely true from the fact that circumstances in the two cases are materially different. In the matter of the state lands that are under lease, not only is the minimum price fixed at which they may be sold, but the different state institutions are dependent upon the returns from these lands for support, and it is absolutely necessary that they must be made to yield a revenue if the institutions are to be maintained upon a cash basis. It is suicidal to compound the debts of the state educational and charitable institutions by issuing warrants to pay running expenses, and more warrants to pay interest on the first issue. It would be folly to exact appropriations from the legislature that would mean only an assumption of debt in another direction. The present system of land leasing, however objectionable, has relieved the state of these two grave difficulties, neither of which appear in the leasing of land by the general government, so that if there is an evil contained in the system, there is also a measure of good that redounds to the welfare of all the people of the state. Another thing in connection with this question that has a great bearing is, that very little of the land can be sold at the present time for the price fixed by law, \$10.00 an acre, as is proven by the returns from the sales conducted by the land office in various parts of the state during the present year. This land, held by the state under lease, must necessarily increase in value, as the other free lands are taken up and can be depended upon to yield a better price at a time when the demands upon the funds will be greater than they are at present. Again, if sold now, and the money placed to the credit of the different institutions, there is always the danger of extravagance which a plethora of funds makes imminent as well as that of loss from other sources, which will be recognized without being mentioned. Undoubtedly it will not be many years before conditions will make a change in the system of management of the land grants necessary. The growing value of the lands, the increasing population of the state, the added requirements of the state institutions, will all have an influence. But under present conditions, it is very difficult to conceive of any beneficial change that could be made. In the last analysis, the lands are really held in trust, and it is a business axiom that real estate is the very best security. Certainly the opponents of the plan followed by the present Board of Land Commissioners

have advanced no new one to take its place—nothing that offers greater security for the future, or more benefits to all the people for the present.

STATE LANDS.

The area of Montana comprises 93,000,000 acres of land, more than one-half of which is still unsurveyed. Of this immense area the Northern Pacific Railway Company received a grant from Congress approximating 15,000,000 acres. The Indian Reservations about 7,500,000 acres; the Military Reservations 300,000 acres; the Forest Reserves 4,778,000, and the State Lands 3,000,000, leaving 62,422,000 as public lands or held by the settlers and mining claimants.

The State Lands comprise 1,280 acres in each township, granted by Congress for the support of schools, together with such indemnity selections made in lieu of the school lands claimed by settlers prior to survey, or such as is mineral in character, or school lands within reservations established by the Federal Government, and all designated as School Land, amounting to over 2,300,000 acres. With the extension of the public surveys this grant receives its additional acreage.

In addition to the School lands Congress granted 668,080 acres for the benefit of State institutions as follows:

Capitol building	182,000
Agricultural College	140,000
School of Mines	100,000
Normal School	100,000
Reform School	50,000
Deaf and Dumb Asylum	50,000
State University	46,080

668,080

These lands being distributed over a vast area possessing altitudes of marked divergence and subject to the climatic influences of several mountain ranges and extensive forests, a diversity of soil and climate is obtained that affords a wide range of diversified industry. In their classification 85,000 acres are agricultural land, 279,000 are classified as timber land, estimated to have 912,000,000 feet of saw timber thereon, and the balance being classified as grazing.

In making this classification only such lands as were actually under cultivation were classed as agricultural land. Many thousands of acres classified as grazing land will no doubt be reclaimed and placed under irrigation by either public or private enterprise, thus transferring such lands from the classification of grazing to that of agricultural. In many instances this is now being done and should the Federal Government lend its assistance in this matter wonderful results are in store for those portions of the State now occupied only by the silent herds of sheep, cattle and horses.

State Agricultural Lands.

The agricultural lands are situated mostly along the streams and rivers that afford opportunities for irrigation systems not too elaborate for the individual farmer to construct. This, however, does not necessarily apply to

the lands in Flathead county where the precipitation of moisture is sufficient to grow crops without irrigation. In this county the State has 200,000 acres of land, 16,000 of which are classified as agricultural and the remainder being nearly all timber lands. The land in this county is regarded as the most valuable of any of the State holdings on account of its fertile soil and exceedingly favorable climatic conditions. In the Flathead valley several thousand acres of State University land are located that for several years past have established a record for prolific production of fruits, grains and vegetables.

In the Gallatin valley 8,000 acres of agricultural land belong to the State. These lands are mostly under systems of irrigation and have contributed their share toward giving this valley the reputation of being the granary of the northwest.

In the Bitter Root valley are 3,000 acres of State land that comprise part of this great fruit growing section. Here, also, irrigation is utilized in the cultivation of the soil.

In other portions of the State the agricultural lands are found in the river bottoms and lower benches and generally are placed under irrigation, producing hay and grain as winter forage for stock that live upon the ranges during the open season.

State Timber Lands.

The State timber lands are located in the western portion mostly upon the western slope of the Rocky Mountains. In Flathead county the State has 180,000 acres of land which bears yellow pine, tamarack, fir and spruce. Much of this land when cleared of its forest becomes most valuable for agricultural purposes and no doubt upon the cutting away of the timber many farms will be opened up where now reigns only the solitude of the forest.

Missoula county ranks next in its vast growth of timber and at the present time is the scene of greatest activity in the lumber industry. There are 65,000 acres of timber land placed to the credit of the State in this county. Ravalli and Powell counties are also well stocked and the State is heavily interested.

In its disposition of timber the State uniformly adheres to the policy of selling stumpage to the highest bidder, after due advertisement has been made. The minimum price fixed by the State Board of Land Commissioners is \$2.00 per 1,000 feet (Scribner's Rule) as measured by the State scaler upon the ground immediately after the cutting of the logs and before their removal from the land. This method of selling the timber yields the price of \$10.00 per acre to the State and leaves the land still in possession of the people, which very often proves to be a valuable asset.

State Grazing Lands.

Grazing lands comprise over 2,500,000 acres which is by far the greater portion of the State's holdings and are scattered from border to border of the commonwealth. In Madison and Beaverhead counties many thousand acres were selected several years ago as being favorably located for irrigation should the State ever enter upon such an elaborate enterprise. Notwithstanding this land lies upon level benches and produces good growths of



THE WAY IT USED TO BE

From a painting by Montana's Cowboy Artist, C. M. Russell

grass it yet remains in the list of grazing land. Upon the benches of Cascade county is situated a considerable amount of State land that lies in the "rainy belt," a region subject to local rains, that, although producing annual crops of hay, continues to be classed as grazing land.

Sale of State Lands.

The minimum price established by the State Constitution for this land is \$10.00 per acre. Should, however, any land be appraised for more than \$10.00 per acre it cannot be sold for less. Every five years, or whenever it is deemed expedient by the State Board of Land Commissioners, the unleased lands in each county are advertised for sale or lease. These offerings are conducted by the Register of the State Land Office, each tract being offered separately for sale or lease to the highest bidder. The terms provided by law are either all cash payment or 30 per cent cash, the balance to be paid in seven equal annual payments with interest on deferred payments at the rate of 7 per cent per annum, except timber lands which are sold for cash. Not more than 160 acres of land is sold to one person, except in grazing lands more than 160 acres may be sold if, in the judgment of the State Land Register, a sale of a single 160 acres would work an injury to the balance of the section.

Leasing of State Lands.

Each tract of State land for which no bid for its purchase has been received at public auction is immediately offered for lease at the rate of six and one-quarter per cent of its appraised value per acre, such lease to run for five years, each year's rental to be paid in advance as it becomes due. Each lessee is required to give bonds in the name of two resident and solvent sureties for the amount of the deferred rentals. The lessee is fully protected in all his improvements upon the land and should he desire to clear it of brush, secure a water right or construct an irrigating ditch, by making application to the State permission is invariably granted and the records made to certify such improvements to his credit. The Register is thereby restrained from issuing a certificate of purchase or new lease to another applicant at the termination of the original lease until the old lessee is paid the appraised value of the improvements or has elected to remove them.

All lessees having improvements upon state lands and not wishing to re-lease the same have the privilege of disposing of or removing such improvements as are capable of removal without damage to the land at any time within ninety days from the expiration of their lease. Should, however, the old lessee desire to re-lease the land he is given preference over any new applicant.

It is further provided in the statutes that if, after a public offering in any county, there still remains State lands unleased, the same may be sold at private sale by the Register subject to the approval of the State Board of Land Commissioners or placed under lease at the rate of $6\frac{1}{4}$ per cent of its appraised valuation.

Governor Joseph K. Toole in an address delivered before the Northwestern Wool Growers' Association at Great Falls, made an exhaustive statement of the condition of the various land grants to state institutions, and

the policy of the board which administers this great trust. The Governor said:

“Montana has school lands amounting to 2,341,000 acres, and land grants to state institutions aggregating 668,080 acres.

The Flathead Indian reservation has more than twice as much, and the Fort Peck and the Crow Indian reservations have each more than three times as much land to their credit as was granted by Congress for our state institutions. Our grants are divided as follows:

Public Building Grant—Total grant, 182,000 acres; selected, 151,351 acres; to be selected, 29,648 acres; about 50 per cent timber, the balance grazing and agricultural; total sales, 1,080 acres; bonds issued against this grant, \$350,000; annual interest, \$21,000; at the time of issuance of bonds (April 22, 1898) the annual income was \$2,661 and there remained 61,747 acres to be selected; total receipts from leases of land to June 1, 1902, \$21,304.

Agricultural College—Total grant, 140,000 acres, all selected; about 43,000 acres timber land, 97,000 acres grazing and agricultural; sold, 313 acres; bonds issued, \$100,000; annual interest, \$6,000; at the time of the issuance of the bonds (July 1, 1895), the income was nothing and there remained to be selected 63,992 acres; total income from leases of lands, \$31,281.

School of Mines—Total grant, 100,000 acres, all selected; timber, 27,500 acres, 72,500 grazing and agricultural; sold, 214 acres; bonds issued, \$120,000; annual interest, \$6,000; income at time of issue of bonds (November 27, 1900) \$5,980, and there remained 3,300 acres to be selected; total receipts from leases, \$24,593.

Normal School—Total grant, 100,000 acres, all selected; about 30,000 acres timber, balance grazing and agricultural; sold, 520 acres; bonds issued, \$70,000; annual interest, \$4,000; income at time of first issue (July 1, 1895) \$456; total receipts from leases, \$27,471.

Reform School—Grant, 50,000 acres, all selected; timber, 8,500 acres; grazing and agricultural, 41,500 acres; bonds issued, none; warrants outstanding, \$10,000; annual interest, \$840; income from leases of lands, total, \$18,838.

Deaf and Dumb Asylum—Total grant, 50,000 acres, all selected; timber, 20,000 acres; grazing and agricultural, 30,000 acres; sold, 880 acres; bonds issued, \$45,000; annual interest, \$2,700; income at time of issue (March 4, 1897), \$857; total income from leases, \$10,862.

State University—Total grant, 46,080 acres, all selected. Timber, 1,580 acres; agricultural 12,280 acres and grazing 32,220 acres. Sold 4,280 acres. Bonds issued, \$140,000. Annual interest, \$8,000. Income at time of first issue (July 1, 1897), \$9,142. Paid out as interest, \$30,000. Receipts from lands leased, \$68,958.

School Lands—Amount, 2,341,000 acres. Amount sold to November 30, 1901, 19,940 acres. Income from rentals, \$506,978.

Recapitulation.

Institutions.	Bonds Issued.
Public buildings	\$350,000
Agricultural College	100,000
School of Mines	120,000
Normal School	70,000
Reform School warrants	10,000
Deaf and Dumb School	45,000
University	140,000

Total \$835,000

The amount of annual interest to be paid on bonds issued is \$48,400.

Perhaps no question with which the state has to deal has given more

concern than the administration of the trust involving the disposition of its lands which came from the federal government.

So solicitous was Congress in that matter, and so determined was it that we should not follow the reckless example of other states in the mad rush to squander our vast patrimonial estate, that it provided in the several grants to us against any sale by the state for less than ten dollars an acre, but provided for leasing, which has been availed of where sales could not be made at a minimum of ten dollars per acre.

Policy of the Board.

This brings me to a brief reference to the policy of the present Board of Land Commissioners, which I am confident has been misunderstood in certain localities. That policy as promulgated and strictly adhered to since June 1, 1901, has been:

First—That state lands now classified as 'agricultural shall be reappraised, and all lands not under lease at the time same is reappraised shall be sold in the manner and upon the terms provided by law. Lands, which at that time are held under unexpired leases, shall be sold in the same manner upon the expiration of such leases. Where unleased lands can not be sold within a reasonable time, (a period to be fixed by the Board), the same shall be leased subject to the right to sell the same whenever the state so desires, notice to be given the lessee in such cases of intention to sell, on or before the first day of September next ensuing, and possession to be delivered on or before thirty days thereafter.

Second—That all timber land shall likewise be re-appraised whenever it is deemed necessary to ascertain its true value, and sold for cash only, whenever deemed for the best interest of the state.

Third—That all grazing land (the minimum price of which is \$10 per acre) be likewise sold if possible in the manner provided by law, and in the event the same can not be sold, that the same be leased in the manner provided by law, in tracts not exceeding 640 acres, as provided in the enabling act, preference being given to the adjoining actual settler, and in all such leases that the right be reserved to sell said lands and terminate said leases whenever an opportunity to sell is offered—the lessee to have the preference right of purchase; and that the further right be reserved to enter upon any of said land so leased to construct ditches, dams, flumes or reservoirs under such regulations as the Board may prescribe in case the state or federal government should require a right-of-way thereon under any system of state or national irrigation which may be inaugurated.

Fourth—That the right to lay out county roads along the section lines of any grazing lands hereafter leased be reserved, so that the state may, if deemed expedient, consent to the same.

Fifth—That in all selections hereafter to be made, whether as lieu lands or unsatisfied grants, in any county where more than 50,000 acres have been selected, all selections shall be made so that not more than two sections shall be contiguous at any point; and not more than two sections shall be selected in any one township; but this subdivision shall not apply to timber land.

Sixth—That all the selections which the state is entitled to make out of any tracts now reserved by the United States for that purpose, be forthwith selected, to the end that such reservation may be released and open to settlement.

If this policy is wrong in any respect it is because the lease limit of 640 acres is made to apply arbitrarily, instead of to the school sections (16 and 36)—and those granted to the University—a question which, when it arises and is settled by the courts, will be conformed to if it be determined the views of the Board are wrong.

Situation on Cut Bank Strip.

There is another matter about which misinformation prevails in this part of the state. I refer to the selection by the state of about 8,000 acres of land in what is known as the "Cut Bank Strip." It will be remembered that the federal government with the view of inaugurating a system of irrigation under its own supervision, deriving its source of water supply from St. Mary's lake, withdrew from entry under the land laws in Teton and Choteau counties about 2,600,000 acres of our public domain. The small strip of 8,000 acres also selected by the state on the 29th of May, 1902, was a part of this reservation.

It was made first, because it was believed that it could never be brought under reclamation on account of its topography.

Second, because it was known that it could be leased as grazing land, and yield a rental to the state, and thus contribute to supporting the institutions for which it was selected.

So considerate, however, was the State Board of the great enterprise projected by the government that it passed a resolution which accompanied the state's application to select the same, wherein it declared that whenever it was ascertained upon actual survey and location of ditches and reservoirs, the lands selected were to necessarily insure the success of any plan or scheme put forward by the United States to irrigate the same, that the same would be relinquished by the state, and to this end, it was agreed that the state should make and the United States allow the selection.

It was further declared and placed of record on the minutes of the Board, that in all leases made to said strip or any part of the same, the right was reserved to cancel the same without notice whenever the United States should require the same for any irrigation project.

This was deemed prudent, in order to demonstrate that we were in hearty accord with the government in its new and beneficial policy to reclaim the vast arid area of northern Montana, and at the same time procure much needed revenue for the institution which was to be the beneficiary of the selection. It may, therefore, be understood that the policy pursued and which will be pursued looks first to the sale of such lands as can be sold at advantageous figures of not less than ten dollars, the minimum fixed by law; second, the leasing of what can not be sold. This seems to be a duty which as trustees of an express trust, we are bound to perform."

HOW TO GET STATE LANDS.

State lands are of two kinds. The grants made to the State for the support of its educational institutions, the minimum price of \$10.00 an acre being fixed by law; and arid land granted to the State under what is known as the Cary Act by which the State obtains possession of land upon its reclamation through irrigation. The former is under the control of the State Board of Land Commissioners, the records being kept in the office of the Register of State Lands. Under the law all lands must be offered for sale at public auction, due notice of the time, place and description of the land offered for sale being made by publication in the newspapers. No bid of less than \$10.00 an acre can be considered. If there is no buyer, a lease of the land is also offered at the auction. Failing to sell or lease, the land may be privately sold or leased, sales being made by the Board of Land Commissioners, and leases by the Register of the land office directly. Permits for the use of land for grazing purposes, may be given if for any reason the land is not ready for listing at an auction sale, for one year only. But these permits may be terminated at any time and the land put up at

auction. All communications relating to State lands should be addressed to the Register of State Lands, Helena, Montana.

RAILROAD LANDS.

The railroad lands of the State are those granted to the Northern Pacific Railroad by the Government for the construction of that road, and originally consisted of every alternate section for forty miles on each side of the right-of-way through the State. Much of this land has already been sold, but there are still thousands of acres suitable for grazing, or for colonization by irrigation companies. This land is valued at from \$1.25 an acre to \$2.50 an acre, although some has been sold at \$10.00. Little of the latter is left, and the greater part is now grazing land. Not less than a section is sold and those lands that are or can be watered are generally used to sell two or more adjoining dry sections, which otherwise could not be disposed of. Inquiries for this land should be addressed to the Northern Pacific Land Office, Helena, Montana.

It is also possible to purchase from the large lumber companies land from which the timber has been cut, at a very low price. This is good land when cleared and some fine farms have been made from it.

Aside from those enumerated the usual methods of transfer are identical with those of other states. Government laws apply to all government land, and State laws apply only to State lands.

THE ARID LAND COMMISSION.

This body is authorized by an act of the State legislature, approved March 8, 1897, and amended Feb. 13 and 28, 1899, which was passed to effectualize in Montana an act of Congress known as the Cary Act, approved August 18, 1894, and amended June 11, 1896. This act bound the General Government to grant to each state in which there was "desert" lands, such lands free of cost for survey or price, not exceeding 1,000,000 acres in each state, as the State may cause to be irrigated and reclaimed.

The state law provides:

1. The State Arid Land Grant Commission shall be composed of 5 members.
2. It is empowered to select lands and to make surveys of necessary water systems for the reclamation.
3. To enter into contracts for the construction of water systems, and to cause the lands to be settled.
4. To issue 30-year 6 per cent bonds to meet the cost of reclamation and settlement of lands, which bonds constitute a lien upon the land, water rights, water system and appurtenances belonging to a district.
5. To issue 30-year 6 per cent bonds, to develop water power plants, and water supply for domestic use, for the redemption of which bonds a sinking fund is provided. These bonds constitute a lien upon the water system and appurtenances. All bonds can be foreclosed as in the case of mortgages for non-payment of principal or interest.
6. To sell such bonds at par for cash, and pay cash for construction, or to pay bonds in lieu of cash.
7. The Commission exercises full and immediate control over all con-

struction and requires suitable indemnity from the contractor in the form of a bond from some reliable surety company.

8. The Commission retains 15 per cent of the entire cost of construction of water systems and settlement of lands, until both are fully accomplished.

9. The Commission operates and maintains perpetually the water system, charging the entire cost of such maintenance and operation equally against all acreage in the district.

10. The Commission sells all lands and water rights, collects all moneys and places them in the Treasury of the State.



A BUSINESS DAY AT UBET.

11. In the event interest is not paid when due for want of funds, interest coupons may be registered in the office of the State Treasurer, which registered coupons will draw interest at the rate of 6 per cent per annum.

12. In the event there is a surplus in the State Treasury after providing for the redemption of coupons next due the Commission may require the State Treasurer to invest such moneys in State, County or School District bonds, or it may cause such moneys to be placed in trust for the benefit of bondholders.

13. The Commission will provide for the payment of interest and principal in the manner shown herewith in terms of sale and regulations.

Conditions of Sale of Lands and Water Right Lien.

The land and water right designated are and shall be subject to a lien as set forth in An Act of the Legislature of the State of Montana, entitled "An Act to Amend Sections 3530 to 3547, Inclusive. Article II, Title

VIII, Part III, of the Political Code of the State of Montana, Creating the State Arid Land Grant Commission, and defining its powers and to add thereto Sections 3548, etc." approved March 8, 1897, until the entire purchase price thereof and interest thereon at the rate of 6 per cent. per annum is fully paid.

Terms of Sale.

1. The purchase price hereof shall be due and payable ten years from the date of the first issue of the bonds of this District.
2. Annual interest shall be due and payable in advance beginning with the date hereof, as is more fully shown upon a certain coupon note this date executed by the purchaser.
3. Bonds of the District with accrued interest will be received at any time in payment of principal or interest.
4. Settlement shall be made upon the land by the purchaser according to law.

Use of Water.

The Commission shall regulate the flow of water according to crop requirements, and waste of water will not in any instance be permitted.

Tolls.

All expenses incurred on account of the administration and maintenance of a District shall be charged according to law.

Miscellaneous.

The District Superintendent shall have full control of the entire District system, subject to the orders of the Commission.

Under the provisions of the law the Commission has made selections of lands in four districts of the State, and have numbered them 1, 2, 3 and 4.

District No. 1 contains 10,632.88 acres of bench lands immediately adjacent to the city of Billings, in Yellowstone County.

District No. 2 is located in Sweet Grass County, near the town of Big Timber, and comprises 50,000 acres.

District No. 3 embraces 20,000 acres of bench land in Carbon County, contiguous to Bridger and Red Lodge. It contains some of the best land in this part of the State, and will add very materially to the productivity of the rich County of Carbon.

In District No. 4 the actual results of this system of reclaiming arid lands can be studied. This tract of 33,000 acres lies in the northern part of Lewis and Clarke County, about 30 miles west of Great Falls and 50 miles north of Helena. Up to the present time, only 11,000 acres of the tract is supplied with water and available for settlement. The work done by the contractors consisted in rebuilding and enlarging an old ditch that had been begun as far back as 1888, and in extending the same to the lands selected by the Commission. The water is taken from the Dearborn river, and is diverted into the valleys of Auchard Creek, Flat Creek, Dry Creek and Simms Creek, which lie between Dearborn and Sun Rivers. The segregated lands lie in two parcels, east and west of Dry Creek, the part lying to the west being the one upon which the work has been completed. Until the water was turned into the new canal, all the water taken from the Dearborn was

turned into Flat Creek, but under the new system, it is carried over the divide and will be diverted into all the streams and dry coulees running north to the Sun River.

The work was done under contract by the Dearborn Canal Co., supervised by the Commission, and involved an aggregate of \$410,000 or \$12.50 an acre for every acre redeemed. The first canal was started April 5, 1901, and the water was turned in October 7, of the same year.

The bonds, based upon the value of the land, and issued to the construction company as the work is done, draw 6 per cent interest and are practically valueless unless the land is sold and settled. The State does not guarantee them aside from the value of the land, and they cannot be foreclosed until the expiration of 30 years. The law restricts the amount of land to be sold to any one person to 160 acres, and the price is the actual cost of putting the water on with 20 per cent added which, in this case, will make the cost with a perpetual water right, \$24.00 for 160 acres. The terms of payment are one-tenth down, and the balance in equal payments for a term of nine years with interest at 6 per cent on deferred payments. After the land is settled and the water is in actual use, the cost of maintenance is to be pro rated among the owners according to the amount supplied, and it is estimated that this will not exceed 15 or 20 cents an acre a year. The Dearborn Canal Company has placed the work of finding settlers for the land thus reclaimed in the hands of the immigration bureau of the Great Northern Railroad, and first payments have already been made upon 40 farms of 160 acres each. The new comers are mainly of Holland descent, and will come from Michigan, Iowa, North Dakota and Minnesota. It is expected that the summer of 1903 will see this new land fully occupied.

BUSINESS OF STATE LAND OFFICE FOR 1902.

During the past fiscal year ending Nov. 30th, the business transacted by this department of the state government exceeded that of any year in its history, the total amount received from sales and leases being \$363,584.63, nearly \$1,000 a day including Sundays, and more than \$71,000 increase over the receipts of the previous year.

The following table shows the receipts each month:

December	\$21,533.40
January	12,148.22
February	19,536.82
March	21,580.16
April	26,303.29
May	17,220.36
June	24,897.08
July	34,912.45
August	37,627.56
September	62,070.25
October	39,902.39
November	45,847.65

During the year sales of land were held in 15 counties as follows: Beaverhead, Madison, Dawson, Custer, Rosebud, Carbon, Flathead, Meagher, Fergus, Teton, Silver Bow and Jefferson. The most remarkable of these was that in Flathead County in September, where one piece of land sold for \$41.25 an acre, exclusive of improvements, and the whole sale aver-

aged \$23.00 an acre. One section was leased for \$1,500 a year. The receipts from the sale of timber were not so large as in former years, but several contracts were made which will yield large returns in the near future. The receipts were apportioned to the different funds as given below:

School funds—Sales, \$83,542.02; rentals and interest on deferred payments, \$160,405.07; timber sales, \$10,056.27.

University—Sales, \$34,029.02; rentals, \$4,870.21.

State Capitol Building, Interest and Sinking Funds—Sales, \$8,076.91; rentals, \$3,931.26; timber sales, \$2,168.49.

School of Mines—Sales, \$619.05; rentals, \$7,105.32; timber sales, \$666.65.

State Normal School—Sales, \$3,084.60; rentals, \$7,369.04; timber sales, \$6,187.08.

Agricultural College, Bond—Sales, \$2,581.84; rentals, \$855.25; timber sales, \$6,281.84.

Agricultural College, Income—Sales, \$1,300; rentals, \$7,654.36.

State Reform School—Sales, \$4,490; rentals, \$3,092.05.

Deaf and Dumb Asylum—Sales, \$1,650; rentals, \$2,819.47; timber sales, \$666.65.

The total acreage now under lease in all the grants is 1,676,395.60 acres which bring a revenue of \$186,553.52 a year. A little more than eleven and one-tenth cents an acre, and is divided among the following funds:

School	1,355,545.43	acres
University	28,543.71	"
Capitol	47,376.60	"
School of Mines	61,991.59	"
Normal School	52,657.98	"
Agricultural College Bond	5,532.28	"
Agricultural College Income	67,811.30	"
Reform School	30,488.54	"
Deaf and Dumb School.....	25,172.52	"
Soldiers Home Aid	1,275.61	"

The latter is the old Fort Maginnis Military Reservation, which was selected by the state upon its abandonment by the United States, for the benefit of the Soldiers Home at Columbia Falls. The most remunerative of all the state lands has been the school addition to the City of Missoula. This property, lying to the northwest of the city, has yielded the magnificent sum of \$50,344.91, and the appraised value of what remains unsold, together with the deferred payments, is \$68,905.09, or a total of \$119,250 for a single section of land.

DISTRIBUTION AND ASSESSED VALUATION OF FARM LANDS.

The table here given shows the number of acres of land, exclusive of railroad grants, that is returned for taxation and the value of the same as fixed by the County Commissioners sitting as boards of equalization, totals only being used from the fact that in many cases the lands are not in any way classified by the assessors. This is true of Beaverhead, Broadwater, Custer, Dawson, Fergus, Madison, Rosebud, Teton and Valley counties. In all the other counties lands are classified as first and second-class grain land, first and second-class hay land, fenced and unfenced grazing land,

and timber lands are classified as (1) bearing saw timber and (2) all other. First-class grain land is assessed at from \$10 to \$30 an acre, while the lowest assessment is on unfenced grazing land at 75 cents an acre. The railroad lands are assessed at 85 cents an acre. Cascade County leads in the value of lands, having a total of \$3,290,226.00. Two counties, Gallatin and Missoula, report a valuation of more than \$2,000,000, while Fergus, Flathead, Lewis and Clarke, Meagher, Ravalli and Yellowstone report over \$1,000,000. Fergus County reports the greatest acreage, 744,133, while Valley County gives 10,414 acres of unfenced grazing land as the total of all land owned in that county. Deer Lodge, the smallest county in area in the state, reports 83,432. The whole number of acres reported for the state is 10,542,536, with a valuation of \$25,300,972, an average of \$2.42 an acre. The following table exhibits the number of acres of land in the State of Montana, with the valuation as fixed by the County Boards of Equalization:

	Acres	Valuation
Beaverhead	284,795	\$811,515
Broadwater	207,314	626,540
Carbon	65,523	547,320
Cascade	650,279	3,290,226
Choteau	257,247	681,504
Custer	684,242	524,824
Dawson	645,062	282,989
Deer Lodge	83,432	280,007
Fergus	744,133	1,318,729
Flathead	679,483	1,857,445
Gallatin	489,320	2,753,540
Granite	113,823	267,043
Jefferson	211,936	455,935
Lewis & Clarke	447,497	1,555,270
Madison	382,792	890,525
Meagher	623,083	1,049,204
Missoula	816,793	2,088,766
Park	386,359	951,103
Powell	403,123	698,838
Ravalli	266,353	1,149,890
Rosebud	413,914	366,719
Silver Bow	86,996	329,890
Sweet Grass	528,047	706,109
Teton	224,529	752,308
Valley	10,414	31,243
Yellowstone	836,047	1,033,490
	10,542,536	\$25,300,972

THE TORRENS LAND SYSTEM.

This method of establishing titles to land was originally applied and perfected in Australia. Massachusetts was the first state to adopt it and the first to make its use mandatory. Illinois, California, Oregon and Minnesota have also adopted it, and a number of other states including Montana, have commissions now engaged in investigating the subject. In every case where the law has been attacked, the courts have sustained its constitutionality, and its practical operation has given great satisfaction to the people in all localities where it has been tried.

The Torrens system substitutes for the present system of registering deeds a system of registering titles. Instead of an ever lengthening list of deeds to be examined by a lawyer, whose opinion as to the validity of the title conveyed is often the purchaser's sole guaranty, is substituted a certificate as simple as a certificate of stock, showing on its face in whom the title is vested, and also all the liens or other interests existing in the premises in question. The correctness of this certificate is guaranteed by the State.

The evils of the present system may be partially enumerated as:

1. The cost of the abstract or its continuation, and the opinion of counsel upon every transfer.
2. Delay may extend to several months, the time being spent in procuring abstracts and deeds to fill the gaps in the chain of title and in negotiating as to claimed defects.
3. Errors may and do often exist in the abstract. They may and do often exist in the opinion of counsel.
4. The constantly lengthening chain of deeds to be examined which always increases the expense, delay and insecurity.
5. These defects operate as a perpetual tax upon the holder of real estate, and depreciate its value.

Compared with the present system the new method of transfer by registration shows the following advantages:

1. The cost of an initial registration under the Torrens law is about \$25.00—less than the usual cost of a single transfer under the present system. The cost of all subsequent transfers is greatly reduced, the entire cost of an ordinary transfer of a piece of registered land upon sale or mortgage being about \$3.00.

These charges, being fixed, are ascertainable in advance, so both buyer and seller know beforehand the expense of carrying out any transfer. An ordinary transfer or mortgage of registered land is a transaction so simple in its nature that the real estate broker, or even the parties themselves, if of ordinary business intelligence, may easily carry it into effect and without the aid of a lawyer or an abstract of title. Certificates of title thus become available for short time loans.

2. Registered land may be sold or mortgaged and the money safely paid over within an hour or two after the making of the verbal contract. The ownership of the property, and whether incumbered or not, is shown by the registry book at a glance. The certificate held by the owner shows the title at its date, and inspection of the original certificate of title, or in lieu thereof, a certificate of search obtainable from the registrar, will show all subsequent liens. If none appears, the money is paid over, the certificate of title accompanied by the deed or mortgage is delivered to the registrar, the proper entry made upon the register, and the transfer is complete.

3. By the Torrens system the title is vested or quieted by law at each transfer, hence upon a proposed transfer no search back of the preceding transfer is necessary. Everything necessary to know will appear upon the original certificate of title. This curtailing of the search greatly reduces the risk of error. All rights of the buyer to recover damages from

the seller for any imperfection in the title, if warranted, are fully preserved. If any purchaser, through caution, desires to satisfy himself as to the correctness of any first registration, he may examine or have his counsel examine the abstracts and all other evidences of title upon which the first registration was made. All subsequent transfers or dealings with the registered title are matters of public record, and are also open to examination if the purchaser so desires. Such examinations will become less frequent in time, until they disappear altogether, the act of the registrar being final in all cases.

4. Under the present system, all deeds and mortgages are copied at length in the books of the recorder and the originals returned to the owner. There is no copying of any deed or mortgage of a registered title, as the original instruments are retained by the registrar. The area of search is confined to a single page.

5. A safe method of much more quickly transferring titles at a smaller cost increases the saleable value of the property.

Initial Registration.

Unless the law is mandatory, which is the case only in the State of Massachusetts in this country, it is optional with the owner to register his land. He files in a court of competent jurisdiction his application in writing for the registration of his title. This in ordinary cases is a simple blank form, giving the name of the owner, description of the property, and other facts concerning the condition of the title. All persons interested in the land, and all persons in possession or occupancy, must be made parties defendant. Summons is issued to all defendants. Such as reside or are found to be within the State will be served by the proper sheriff. Non-residents will be served by publication. Due opportunity to contest the matter must be afforded to all interested.

The court refers the matter to an examiner of titles, who proceeds with an independent examination of the title. To him is submitted the abstracts of title and any oral testimony tending to determine the rights of all parties. He approves no title unless satisfied that all persons interested are before the court. If, in his opinion, the applicant is entitled to registration, he so reports to the court. To the report of the examiner, any party may file objections, which are heard and disposed of by the court. Upon the confirmation of the report a decree is entered confirming the applicant's title, and directing the registrar to issue to him the first certificate of title. This is done by entry in a book called the "Register of Titles." This book is composed of a large number of certificates of title, one on a page, bound together, numbered in the order of their issue, and each with ample space at its foot for the entry of subsequent notations affecting the title. Every certificate is in duplicate, signed by the registrar, and recites the condition of the title. One of these is kept in the bound book by the registrar, and the other is delivered to the owner. This completes the initial registration.

Transfers.

Transfers of registered land are made in the following manner: The owner executes the usual deed, and submits it, together with his certificate of title, to the buyer.

In every transaction the owner must produce his duplicate certificate of title. He can do absolutely nothing without it. If lost or destroyed, upon proper showing the owner receives a certified copy marked "Owner's certified copy, issued in place of duplicate lost." This, after entry of the transaction upon the original certificate, answers the same purpose as the lost certificate. No new forms of conveyance are required. The buyer, after inspection of the original certificate of title in the register, safely pays over the purchase money, and receives the deed and the duplicate certificate. He then delivers them both to the registrar, who, when satisfied as to the identity of the parties, and that the transfer should be made, notes it upon the register. This operates to transfer the title. No title passes by the transfer of the deed. The deed, after delivery and before the registration of the transfer, is a mere contract between the parties. Its sole object is to authorize the registrar to register the transfer. The transfer is registered when the registrar cancels the old certificate of title and issues a new one in duplicate as before; one called the original, being retained in the register, and the other, called the duplicate, after a proper receipt therefor filed with the registrar, is delivered to the buyer, now the new owner. The deed is kept by the registrar.

Mortgages.

A mortgage of registered land is effected somewhat in the same manner. The owner executes the mortgage in duplicate and delivers it, with the note or bond and his certificate of title, to the lender. The latter, after an inspection of the proper folium in the register, and finding no incumbrance or lien thereon, safely pays over the money to the borrower, and receives the mortgage security with the certificate of title. The note or bond and duplicate mortgages are presented to the registrar, who identifies the transaction upon the register, as well as upon the owner's certificate of title. The latter, with the note or bond, is thereupon returned to the borrower, who may use the same in affecting a second, third or more mortgages.

One of the duplicate mortgages is retained by the registrar; the other with the date of its registration endorsed thereon by the registrar, and the note or bond, is delivered to the lender. When the mortgage is paid a release of the same is filed with the registrar who, when satisfied that the note or bond is duly paid, thereupon notes the release upon the registry book as well as upon the duplicate certificate of title.

The latter is then returned to the owner, or he may surrender it to the registrar for cancellation and receive a new duplicate, containing no mention of the mortgage. Provision is also made for handling property held in trust for judgments and other liens, for adjudicating all adverse claims, covering all dower and homestead rights and transmission under wills, as well as for tax sales and proceedings in chancery.

In nearly all the countries where the Torrens system is in use an indemnity fund is provided to make good any losses incurred by rightful owners in being deprived of their land through fraud or accident. This fund is raised by charging a small fee, one-tenth or one-fifth of one per cent. upon the value of the land when first registered, and for each subsequent

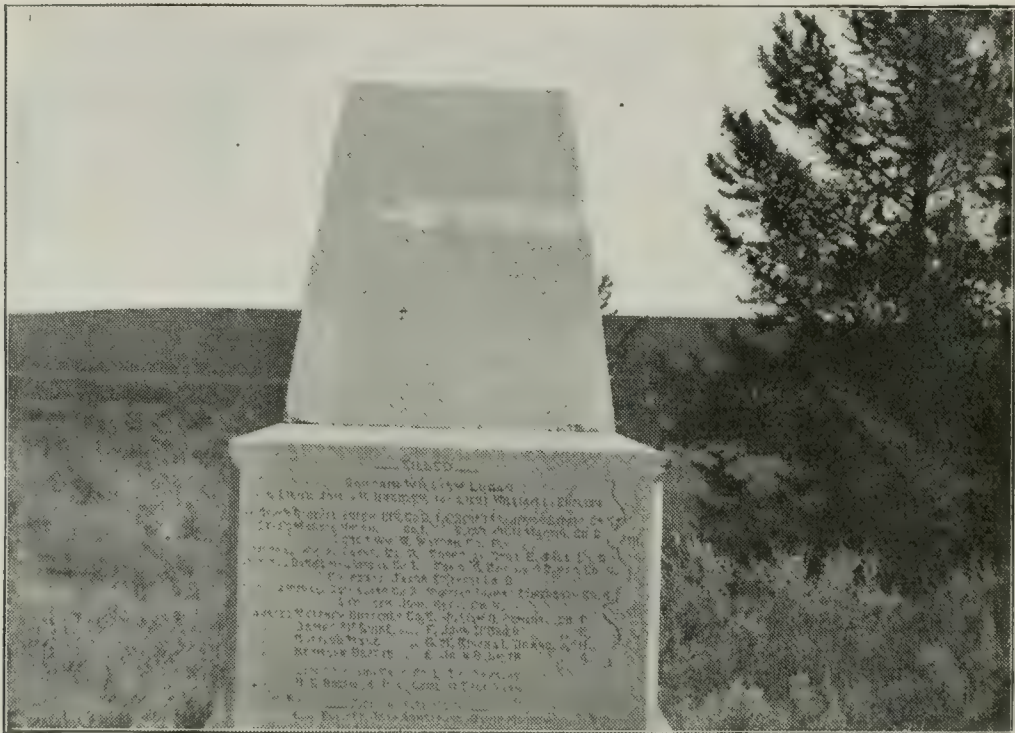
transfer. Small as such fee is, it has invariably proved to be much larger than necessary.

Fees.

As to the expense involved, the table shows the charges made for initial registration, under the Illinois law.

Clerk of Court on filing application	\$ 5.00
Publication notice	2.00
Registrar for examination of title	15.00
Registrar on issue of certificate	2.00
Total	<u>\$24.00</u>

Sheriff's fees for service of summons and the tax for indemnity are to be added. Subsequent transfers average about \$3.00 each.



MONUMENT ERECTED TO THE KILLED AT THE BATTLE OF THE BIG HOLE, BEAVERHEAD COUNTY, JULY, 1877.

IRRIGATION.

Great are the mining interests of Montana; great are its stock interests. The latter branch, by reason of the tremendous proportions it had attained and the methods of conducting it, had come to be classed as greater than the tree—agriculture in all its phases. This fact had grown out of the arid condition of the lands of the state, which had rendered the larger portion of them only adaptable to the grazing of herds until such time as the waters of wasted lakes and rivers of the north could be brought to reclaim this land for the use of the husbandman and home-builder. During the past thirty years the relative position of the stockman and farmer in Montana has changed about with the result that the value of the farms in the state in 1900 was \$10,000,000 greater than that of all the live stock. This is due to the construction of irrigating canals by private companies for the profits they would return as water furnishers to consumers and also to the co-operative diligence of neighboring interests that have been brought together and found ways and means for construction of such water ways for use rather than profit. And, again, 38.4 per cent. of the tilled lands of the state are now producing without the aid of artificial watering. Still there are millions of acres that must yet be watered and the drawback in this direction has been the lack of means to bring water in sufficient quantity to supply the deficiency of natural precipitation. With this defect removed by artificial water ways Montana will cease to be known as a country of mining camps and stock ranges alone, and take her rightful place as one of the great agricultural gardens of the world. For many years the people of the so-called arid West have been laboring against enormous odds to secure favorable legislation which would extend government aid in conserving the water supply, establishing reservoirs and great irrigation works. Such legislation would transform the worthless sage land and deserts into valuable agricultural lands and furnish homes, employment and independent comfort to thousands of people. It is more than satisfying to be able to chronicle their success and to testify that the gratitude of the whole population of Montana goes out to our representatives in Congress who assisted so materially in the passage of the law that means so much for all. The future is bright with hope and in prospect. Montana will grow in population and in the production of wealth. Her natural resources, unsurpassed in any other region in the world, will be fully developed; her cities will grow; her raw materials will be handled in mills and factories at home and deserved prosperity prevail. While the present law may not be all that our people may desire, it is a step in the right direction and will be developed in time as necessity and experience point the way. The bill passed the House of Representatives June 13, 1902; was sent to the Senate,

where it passed without opposition, and on June 18, received the signature of the President.

The bill as passed creates a reclamation fund from the sale of public lands in Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington and Wyoming, less the amount paid in fees to local land offices, and the 5 per cent. due the states under existing laws for educational purposes. This reclamation fund is to be used for the construction and maintenance of irrigation works in the state and territories enumerated. Provision is made for the payment out of the treasury of any deficiencies in the allowance to agricultural colleges, owing to this disposition of public lands.

Section 2 authorizes the secretary of the interior to examine, survey and construct irrigation works and report the cost thereof to congress at each session.

Sec. 3. That the secretary of the interior shall, before giving the public notice provided for in section 4 of this act, withdraw from public entry the lands required for any irrigation works contemplated under the provisions of this act, and shall restore to public entry any of the lands so withdrawn when, in his judgment, such lands are not required for the purpose of this act; and the secretary of the interior is hereby authorized at or immediately prior to the time of beginning the surveys for any contemplated irrigation works, to withdraw from entry, except under the homestead laws, any public lands believed to be susceptible of irrigation from said works; provided, that all lands entered and entries made under the homestead laws within areas so withdrawn during such withdrawal shall be subject to all the provisions, limitations, charges, terms and conditions of this act; that said surveys shall be prosecuted diligently to completion, and upon the completion thereof, and of the necessary maps, plans and estimates of cost, the secretary of the interior shall determine whether or not said project is practicable and advisable and if determined to be impracticable or unadvisable he shall thereupon restore said lands to entry; that public lands which it is proposed to irrigate by means of any contemplated works shall be subject to entry only under the provisions of the homestead laws in tracts of not less than 40 nor more than 160 acres, and shall be subject to limitations, charges, terms and conditions herein provided; provided that the continuation provisions of the homestead laws shall not apply to entries made under this act.

Sec. 4. That upon the determination by the secretary of the interior that any irrigation project is practicable, he may cause to be let contracts for the construction of the same, in whole or in part, providing the necessary funds to complete the work are available in the reclamation fund, and thereupon he shall give public notice of the lands irrigable under such project, and limit of area per entry, which limit shall represent the acreage, which, in the opinion of the secretary, may be reasonably required for the support of a family upon the lands in question; also of the charges which shall be made per acre upon the said entries, and upon lands in private ownership which may be irrigated by the water of the said irrigation project, and the number of annual installments, not exceeding 10, in which such charges shall be paid and the time when such payments shall commence. The said charges shall be determined with a view of returning to the reclamation fund the estimated cost of construction of the project and shall be apportioned equitably; provided, that in all construction work eight hours shall constitute a day's work, and no Mongolian labor shall be employed thereon.

Sec. 5. That the entryman upon lands to be irrigated by such works shall, in addition to compliance with the homestead laws, reclaim at least one-half of the total irrigable area of his entry for agricultural purposes, and before receiving patent for the lands covered by his entry shall pay to the government the charges apportioned against such tract, as provided in section 4. No right to the use of water for land in private ownership shall be sold for a tract exceeding 160 acres to any one landowner, and no such sale shall be made to any landowner unless he is an actual bona fide resident on such land, or occupant thereof residing in the neighborhood of said land, and no such right shall permanently attach until all payments therefor are made. The annual installments shall be paid to the receiver of the local land office of the district in which the land is situated, and a failure to make any two payments when due shall render the entry subject to cancellation with the forfeiture of all rights under this act, as well as of any moneys already paid thereon. All moneys received from the above sources shall be paid into the reclamation fund. Registers and receivers shall be allowed the usual commissions on all moneys paid for lands under this act.

Sec. 6. That the secretary of the interior is hereby authorized and directed to use the reclamation fund for the operation and maintenance of all reservoirs and irrigation works constructed under the provisions of this act; provided, that when the payments required by this act are made for the major portion of the lands irrigated from the waters of any of the works herein provided for, then the management and operation of such irrigation works shall pass to the owners of the lands irrigated thereby, to be maintained at their expense under such form of organization and under such rules and regulations as may be acceptable to the secretary of the interior; provided, that the title to, and the management and operation of, the reservoirs and the works necessary for their protection and operation shall remain in the government until otherwise provided by congress.

Sec. 7. That where in carrying out the provisions of this act it becomes necessary to acquire any rights or property the secretary of the interior is hereby authorized to acquire the same for the United States by purchase or by condemnation under judicial process, and to pay from the reclamation fund the sum which may be needed for that purpose, and it shall be the duty of the attorney general of the United States, upon every application of the secretary of the interior, under this act, to cause proceedings to be commenced for condemnation within 30 days from the receipt of application at the department of justice.

Sec. 8. That nothing in this act shall be construed as affecting or intended to affect or in any way interfere with the laws of any state or territory relating to the control, appropriation, use or distribution of water used in irrigation. And the secretary of the interior, in carrying out the provisions of this act, shall proceed in conformity with such laws, and nothing herein shall in any way affect any right of any state or of the federal government or of any landowner, appropriator, or user of water, in, to or from, any interstate stream, or the waters thereof; provided, that the right to the use of water acquired under the provisions of this act shall be appurtenant to the land irrigated, and beneficial use shall be the basis, the measure, and the limit of the right.

Sec. 9. That it is hereby declared to be the duty of the secretary of the interior in carrying out the provisions of this act, so far as the same may be practicable and subject to the existence of feasible irrigation projects, to expend the major portion of the funds arising from the sale of public lands within each state and territory hereinbefore named for the benefit of arid and semi-arid lands within each state or territory; provided, that the secretary may temporarily use such portion of said funds for the benefit of arid or semi-arid lands in any particular state or territory hereinbefore

named as he may deem advisable, but when so used the excess shall be restored to the fund as soon as practicable, to the end that ultimately, and in any event, within each 10-year period after the passage of this act, the expenditures for the benefit of the said states and territories shall be equalized according to the proportions and subject to the conditions as to practicability and feasibility aforesaid.

Sec. 10. That the secretary of the interior is hereby authorized to perform any and all acts and to make such rules and regulations as may be necessary and proper for the purpose of carrying the provisions of this act into full force and effect.

To supplement this great work which, from its very nature will be slow, will be the duty of the people now residing in the favored region. As it is conceded that it is neither practical nor expedient that great irrigation works should be constructed by private capital, the co-operative method offers the best means of promoting the reclamation of small tracts of arid lands. Larger territory must be covered by state help through the Arid Land Commission. Together these forces will, until the new law becomes effective, be the means of putting thousands of acres under water. The farmers' co-operative associations have been very successful. Having an abundance of time and the necessary teams and tools, and very little cash being required, neighboring farmers work together in building the main ditch, paying for their stock in labor and sharing according to their holdings in the water supply. Some of these enterprises represent an expenditure of as much as \$40,000. Among some of the notable and recently completed works of this character are the Chestnut Valley Farmers' Canal Company's ditch, eleven miles long, and capable of carrying 3,000 inches of water. It will eventually supply an area of 15 miles long and three miles wide lying around Cascade in Cascade county, thus adding largely to the production of that locality. Stockholders own about 4,000 acres and the balance of the water will be rented to those whose lands lie close enough to use it. The principal owners are Messrs. Myron McDaniel, John S. Jones, E. E. James, J. T. Convey, C. H. Austin, Samuel Kelley and A. R. Polson and the J. A. Harris estate. Another great enterprise of this character is the Farmers' Co-Operative Canal Co., of Farmington, Teton County, on what is known as the Burton Bench. This canal was built at a cost of \$10,000 entirely by the farmers interested and is owned and controlled upon co-operative lines. So well satisfied are the owners that it would be impossible for an outsider to purchase any of the stock. The canal runs through the central portion of the "bench" for a distance of 13 miles, and has two branches of five miles each and carries about 6,000 inches of water. This district furnishes some of the finest agricultural products in the world, having grown wheat that went 48 bushels to the acre and oats that weighed 58 pounds a bushel. There are two other canals that furnish water at other parts of the district—the Eldorado, which is also owned co-operatively, and the Burton ditch which waters the southern portion of the "bench." The details of the plan by which the work was accomplished are very interesting, and will doubtless prove of value to those who contemplate a like undertaking. After Mr. Z. T. Burton, an old-time resident of Teton county, had failed in his efforts to form a stock company to construct a canal he

induced his neighbors to join a co-operative association with the avowed purpose of constructing and owning a canal through their own efforts. Bravely they went to work. They had little money, but among them they had horses, plows and scrapers, and all were willing to work in the construction of the canal. Each man was paid in stock at the rate of \$4.50 a day for man and team, and when the work was completed 15,000 acres were under water at an approximate cost of \$1.00 per acre. Under their regulations, each farmer was a shareholder to the extent of the value of the work done by him and is allowed the use of the water in proportion to his holdings of stock. Practically the only expense of maintenance has been the employment of a ditch rider for the few months of the irrigation season at \$60 per month, and the company's financial statements show that the cost of water has only been 10 cents an acre a year, including all interest and other charges. It is manifestly impossible that water could be obtained at this figure under any other than the co-operative system.

Under private construction private water right is held at from \$7 to \$15 or more an acre, and the yearly charge for water is from 50 cents to \$1.25 an acre. The farm owners near Grass Valley, Missoula county, also have under construction a 10-mile ditch which will supply a large territory with water and prove of enormous benefit to those who own land along its right of way. While this work is done under contract, the stockholders are all farmers or owners who control the water for their own use, and it will practically be under co-operative management.

THE MILK RIVER VALLEY.

Another great enterprise is the Hinsdale Co-Operative Canal Co., which will water 60 160-acre tracts in the Milk River Valley. The members of the Montana Ditch Company are also contributing labor and money to run a 9-mile ditch south of Townsend to cover about 7,000 acres of land. The cost will approximate \$18,000 and the canal will carry 6,000 inches of water. The greater part of this work is being done with machinery.

In this connection a letter from Mr. W. M. Wooldridge, Industrial Agent of the Great Northern Railway Line, located at Hinsdale, Montana, is worthy of reproduction. It reads as follows:

Hinsdale, Montana, October 15, 1902.

Hon. J. A. Ferguson,
Commissioner Bureau of Agriculture, Labor and Industry,
Helena, Montana.

Dear Sir:—The last report of the Bureau of Agriculture, Labor and Industry gave special attention to co-operative irrigation in the Milk River Valley. I am pleased to report as a result that a large number of settlers have located in Northern Montana, their attention having first been called to this section through the report of the Bureau.

Since the publication of that report a great change has taken place in matters relating to the reclamation of our arid lands. The passage of the irrigation bill by the last session of Congress has served to call unusual attention to the Milk River valley. This immense valley, extending as it does across almost the entire width of the State of Montana, comprises a territory sufficiently large to create an empire of itself.

Particular attention has been drawn to this section of the state by the Secretary of the Interior, who, in his annual report for 1900, approved of

what is known as the "St. Marys Lake Diversion Canal," which will turn the waters of the St. Marys river into the Milk river, thereby furnishing a greater supply of water with which to irrigate the remaining unirrigated land in that valley. During the year 1901, several large surveying parties were sent by the government to determine if this project was feasible. It was found so to be, and during the year 1902 five different engineering parties have been working in various parts of the valley making location surveys for the canal. Three of these have been operating between Cut Bank and Havre Station, in the western end of the valley; two others are now operating between Malta and Hinsdale.

When the passage of the new irrigation bill was deemed certain something like 2,000,000 acres of land west of Havre station were withdrawn from public entry under anything excepting the Homestead Act. In August, 1902, 41 more townships in the eastern end of the valley between Malta and Glasgow were withdrawn from entry under anything excepting the Homestead Act. This is done under the provision of the irrigation bill mentioned and has as its purpose the holding of these public lands for the actual home builder, who shall locate upon this land in tracts not exceeding 160 acres and reside upon the same continuously for five years.

The plan of reclaiming the entire valley as contemplated, and which will without doubt be pursued, is that a highline canal will be constructed following eastward almost parallel with the International line and through the entire length of the valley; this canal will reclaim what is known locally as the bench land and will furnish water for the many small tributaries of Milk river coming in from the north, making them perennial streams and greatly enhance their value for irrigation purposes. In the construction of this high line canal several large reservoir projects will be included which will be used to store up the flood waters of the St. Marys and Milk rivers. The two St. Marys lakes will also be used to store water for several hundred thousand acres of land. This high line canal will prove a large undertaking, involving the expenditure of probably \$3,000,000; the amount of land, however, which can be reclaimed is so great that it will amount to a cost of not more than to \$10 to \$15 per acre.

The other canal project which will be embraced in the same system, and comes under the same provisions, will be known as the low line canal which will be taken out of Milk river at a point just southwest of Wagner station on the Great Northern Railway, and carried along the south side of the Great Northern Railway through the towns of Malta, Bowdoin, Ashfield, Saco, Beaverton, Vendalia and Tempico, terminating at Glasgow. This low line canal, not being so expensive, can be constructed much quicker, and for that reason survey is being made as rapidly as possible in order that actual construction work can be commenced as early next spring as the dirt can be moved. It is believed that the construction of this low line canal will enhance the value and aid very materially in hastening and aiding the construction of the high line canal inasmuch as the land under the low line canal can be sold at once and the money received from this sale, going into the irrigation fund will, in a large measure, pay the cost of the construction of the high line canal which will require several years to complete.

According to the provisions of the new irrigation bill this reclaimed land can only be secured under the homestead act and will be subject to the actual cost of irrigation after construction. When the cost has been determined a charge will be made against the land and will be payable in 10 annual payments without interest. Assuming that the cost of reclaiming the land under the low line canal will be from \$10 to \$15 per acre; the cost per year to the homesteader would be, if \$10 per acre were charged,

\$1 per year for 10 years; for \$15 it would be \$1.50 per acre per year for 10 years. This can all be paid in one payment if the entryman so desires. Only 160 acres of land can be entered and those already owning land can purchase water for only 160 acres, and will be charged the same price as if they located the land. The idea will be to encourage the actual home builder who will go upon and improve the land.

The question of the government paying for the irrigation of what is known as the arid lands in the western states has been agitated for years. Conventions and congresses have been held in various parts of the western country which had as their purpose some way of bringing the government to realize that it was its duty to reclaim these lands, and to those of us who have for years resided in the west it is hard to realize that the government has at last come to this conclusion, and the fact that it has decided to do so is due in a very large measure to the great work done by Mr. George H. Maxwell and the National Irrigation Association.

By all who have given it any thought the passage of the irrigation bill is deemed fully as important as the passage of the original homestead act, and will result in the rapid upbuilding of the western states. It was the one thing necessary to make it possible for "the man of the east," who was looking for a home in the western states, to go upon this land and make a home thereon. Without water the land was of little or no value, but with water secured by irrigation, it is of immense value for agricultural purposes.

It is believed that the very first work undertaken under the provision of the new irrigation law will be this low line canal of the Milk River valley. Forty-one townships embracing 944,640 acres have been withdrawn. Of these, fully 200,000 acres can be irrigated. Those of the east looking for a chance to locate a desirable homestead need no longer hesitate settling in this portion of Milk River valley. The government has fully committed itself to this plan; the settler has every assurance that his land will be reclaimed and he will be charged merely the cost of reclamation. If he so desires, he can pay this cost in 10 annual payments and that without interest; and further, the government pays the cost of maintenance of the irrigation canal during the 10 year period.

The stations on the Great Northern Railway which will command the greater portion of this reclaimed land will be Ashfield and Hinsdale. At the latter place immigration has been going on for the past three years. The Great Northern Railway has done everything within its power to aid the settlers locating therein. It has built a depot, established a station, built stock yards, established a small experiment station to prove to the settlers just what the land will produce, and a prosperous community has been built up. Independent of the government irrigation canal the settlers themselves are now building a canal which will reclaim 10,000 acres of land. This canal is taken from Rock creek and covers that portion of the valley directly northwest of Hinsdale. All of the lands under this canal have already been located; there is, however, something like 14,000 acres of land immediately west of town which is at present nearly all unoccupied, but which will be covered by the low line canal built by the government. South of Hinsdale towards the Missouri river and north of the town in what is known as Rock creek and Frenchmen creek are vast tracts of land all unoccupied and subject to homestead entries; many settlers have already established themselves both on Rock and Frenchmen creeks and are doing well.

Ashfield is at present a mere siding; a town is now being laid out there and settlers will go in next spring. This town will also build up rapidly, there being a vast acreage of irrigable land unoccupied in this vicinity.

In this portion of Milk River valley there are partially improved farms

which have been located by speculators who had as their object the location of a piece of land, and as soon as this had become valuable to dispose of it to some new comer. This class of people is found in all localities, and occasionally some very choice pieces of land can thus be secured at a nominal figure.

One very significant feature about the Milk River valley immigration is that while poor people may locate land, improve it and sell out to other people later on, it is very seldom that these people leave the valley after selling their land; they will move to another part of the valley and partly or wholly improve another piece of land making it their permanent home.

Heretofore the immigration department of the Great Northern Railway has not felt like encouraging working people to the valley for the reason that there was not much work to be had. This condition of affairs has changed greatly, and during the past two years it has been difficult to obtain a sufficient amount of labor either skilled or unskilled to carry out the entire work through the length and breadth of the valley. When the actual work of the construction of the government canal commences it will be still more difficult to carry on the work on the farms and the building of towns. Those desiring work of any kind, especially farm labor, carpenters, plasterers and blacksmiths, stone masons and brick layers need not hesitate in the least to come to the valley; there is plenty of work for such. I am frequently called upon to furnish such help, and during the past year have been unable to furnish men to meet the demand. Wages for farm labor average about \$30 per month, carpenters \$3 and \$3.50 per day; first-class plasterers 10 cents per yard, two coat work; lathing 3 cents, common laborers \$1.75 to \$2 per day.

It is not desired by the settlers to encourage a class of laborers to this valley who have as their object merely to go there and work for wages. What they desire is to encourage both skilled and unskilled laborers who will have as their prime object the building of a home for themselves, and who will become identified with the interests of the community in which they locate. There is a disposition among the people to discourage as far as possible this transient labor and to encourage those who are already located in the valley and especially those who have built themselves homes. They feel that in employing a man who has a home in the valley that they are benefiting themselves, while any money paid to transient labor is taken out of the community.

There is every encouragement for the farmer, dairyman, poultry grower, and fruit culturalist to establish themselves in this valley. The Great Northern Railway is transporting train loads of these products by these stations from the east to the great mining camps at Butte, Helena and Anaconda at a great cost for transportation charges alone. All these commodities should be produced in the Milk River valley, and the policy of the Great Northern management in the past has been such as to prove that they realize that it is more to their interest to have these agricultural products grown along its lines and as near the point of consumption as possible. It has repeatedly made rates on such products as wheat, oats, hay, potatoes and other articles that would permit the Milk River farmer to market his produce in these camps in competition with any other part of the country.

In the past a great deal has been said about the severity of the climate of Northern Montana and North Dakota, but of late years people have become better posted, and it would hardly seem necessary to go into detail regarding this subject; a few years ago to live in Montana and North Dakota seemed out of the world, but the means of transportation has improved so much that Hinsdale, for instance, is now only about 24 hours' ride from St.

Paul and about the same to the Pacific Coast. The Chinook winds from the Pacific Coast greatly modifies the climate of Northern Montana, and it is not as severe even as that of North Dakota. Thousands of head of stock run out the entire winter without any feed or care whatever. This could not be if the climate was unduly severe.

In conclusion it may be suggested that the government low line canal project for the Milk River valley will be the first opportunity for the homesteader under the new irrigation law. It is possible that a heavy immigration movement will extend to this region during next spring.

Business men seeking an opportunity to establish themselves in a new locality will find it well to consider the various stations covered by this canal; the towns of Hinsdale and Ashfield especially offer inducements to those with capital to establish their business enterprises there.

Very Respectfully,

W. M. WOOLDRIDGE.

CO-OPERATION IN IRRIGATION.

By S. Fortier, Director Montana Experiment Station.

For centuries the Angle-Saxon farmer has been proud of his independence. The community life of the Latin races was not to his liking. Isolation, toil, sacrifice were readily accepted in exchange for a life of freedom and independence. From the landing of the Pilgrims to the present he has built his home throughout the humid regions near the center of his homestead. In the once heavily timbered states east of the Mississippi it required splendid courage to sink deep the axe into the first felled tree of a forest holding and continue the work of felling, cutting and clearing until grain and hay fields took the place of pines and maples. When neighbors settled near him and the clearings merged into a settlement he took care that the line fences were built high and strong between his farm and those adjoining. In this prolonged effort the individualism of the nation was strongly emphasized. Men learned to work singly to good effect, but they were untrained in co-operative enterprises. The eastern half of this continent was subdued by individual and not by co-operative effort.

In 1847, the Anglo-Saxon race crossed the Rubicon, which separated a humid from an arid country, and began the conquest of the western empire. On July 24, 1847, a band of pioneers cut a trench to convey the waters of a small creek near where Salt Lake City now stands to a field of sun-baked soil for the purpose of planting a few shrivelled potatoes. This was the first attempt made by this race to re-claim by irrigation the Great American Desert. These pioneers learned thus early the important lesson that in a region requiring irrigation individual effort will not suffice. Men must learn to join hands and work harmoniously for the accomplishment of a common purpose. For fifty-five years co-operation has been the nucleus around which most of the individual enterprises of Utah have clustered, and to it more than to any other one factor is due the agricultural prominence of that inter-mountain state.

The people of the West fully appreciate the labors of the engineers and scientists of the United States Geological Survey in their behalf. Much of the present knowledge of the mineral and agricultural resources of Montana, for example, has come from that source. In the broad field of irriga-

tion the Department of Agriculture is taking up the work where the Geological Survey leaves off. The latter prepares the maps, measures the streams, and locates the storage reservoir sites and highline canals. The former seeks to improve the present system by defining and establishing rights to the use of water, by introducing a more equitable system of distribution and by demonstrating the necessity of efficient administration under state control. Western people feel grateful for these favors.

As a matter of fact the foundation of the irrigation system of the Rocky Mountain states has already been laid. Future progress will but add to the substructure. In Montana, about a million acres are now irrigated at a cost of about \$7,500,000. How much of this garden has the Government re-claimed? It has been done by the united efforts of the farmers of Montana. Let the work of reclamation go on, under the watchword of "Co-operation." To remain inactive until the Government builds the canals would be detrimental to the best interests of this state. It is to be hoped that the Government will construct the large storage reservoirs and diversion canals of the West. By the law approved last June a few million dollars per annum may be expended for this purpose. It is safe to assert, however, that for every reservoir and canal that are built by the nation there will be one hundred built by and at the expense of the farmers.

This state possesses an attractive field for co-operative canal building. There is yet in many sections a plentiful supply of both land and water, and all that is needed is the united effort of energetic farmers to combine these essential elements of crop production.

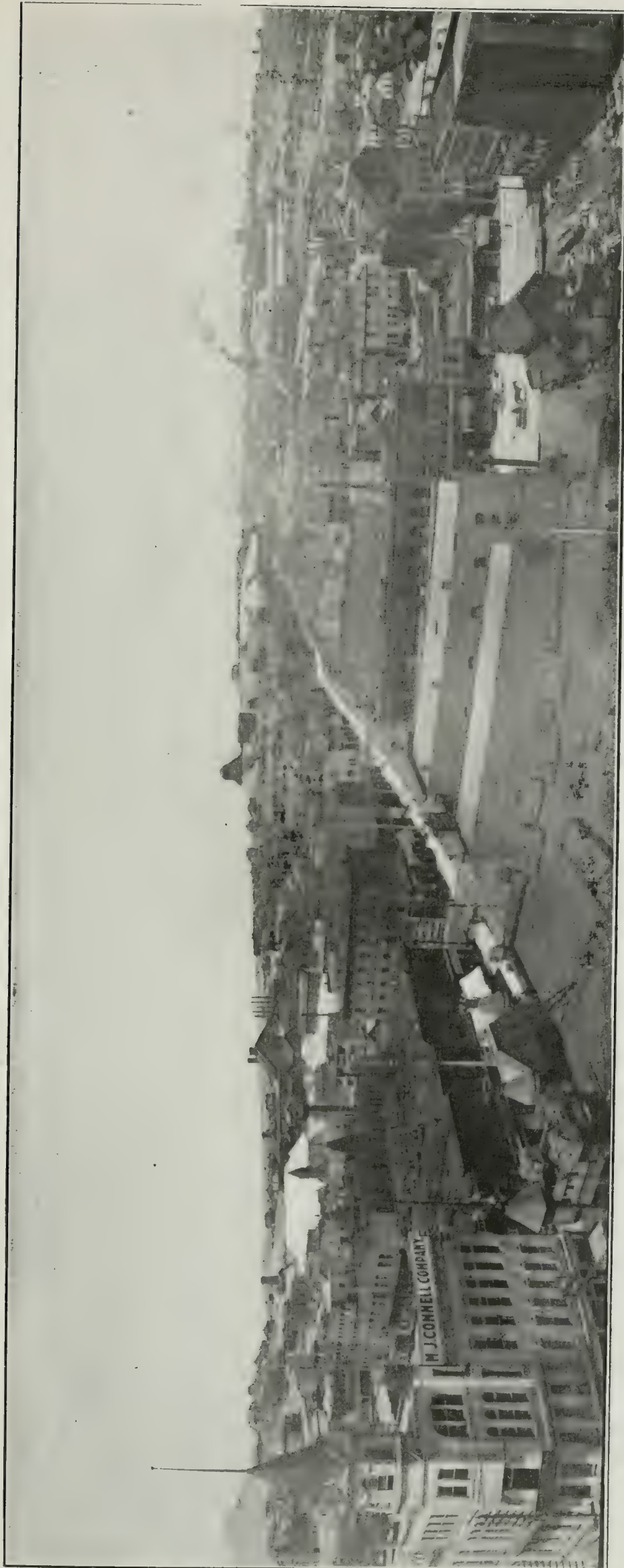
Co-operative Canals.

Co-operative canals occupy a middle place between the small individual ditch and the large corporation canal. With few exceptions canal organizations, in which the owners of the land under the canal are likewise the owners of the stock in the canal, have been successful.

The independent Anglo-Saxon, if given his choice, would prefer to have a separate ditch from the natural stream to his field, but in an irrigated country very few possess farms suitably located, or sufficient means to dig a ditch and acquire a water right of that kind. Besides, the small individual ditch has its drawbacks. It loses a large percentage of the flow passing through its headgate and it necessarily supplies water to low-lying lands that are liable to be damaged by seepage waters.

When one considers the corporation canal which is owned and controlled by outside capital its disadvantages are still greater. Very few of these have ever paid any dividends and the large majority of the men who put money into such enterprises have realized little on their investments. Such canals have, nevertheless, proved of great value to Western America. The value of millions of acres of fertile land has been greatly enhanced in consequence and prosperous communities are now to be found occupying irrigated lands which without the capitalistic canal would have remained barren. The causes which produce so many failures from the investor's point of view are well understood and need but to be named.

Some of the large corporation canals were built by speculators with the



BUTTE, LOOKING NORTH FROM HENNESSY BUILDING.

object of selling the completed canal at a profit. Others were built for the purpose of selling lands which the canal corporations had acquired. There are still others that were built in good faith for the purpose of conveying water to fertile tracts of unoccupied lands, but many of these proved failures. The failures were chiefly due to the heavy cost of operation and maintenance during the first few years of the life of the canal, the small returns in the way of water rental, the difficulty of obtaining settlers under the canal, divided interest and the deep-seated distrust of the ordinary farmer towards the corporation controlled by outside capital.

In co-operative canal companies many of the objectionable features of the irrigation organizations, which are owned and controlled by outside parties, are removed. A certain number of farmers who own irrigable lands near a stream agree to unite to dig a ditch of a certain length and size to convey a portion of the flow to their farms; this association may be a simple partnership, or an incorporated company. When the Mormons settled in Utah they were compelled, being without means, to adopt the co-operative system of canal building. It has proved wonderfully successful in that state. For many years all the irrigation enterprises were planned and carried out by the officers of the Mormon Church. When this authority was no longer exercised many of the rural communities took advantage of a law passed in 1865 which provided for the organization of irrigation districts. The Utah district law had many good features, but there was much trouble over the collection of assessments. The law failed to provide for the enforced collection of delinquent assessments and most of the co-operative canals of that state are now incorporated in the regular way.

Incorporation.

In view of the fact that large numbers of settlers who know little of irrigation practice and custom are finding homes in Montana, a few suggestions as to how to proceed to organize a co-operative canal company may not be amiss.

The preliminary work must of necessity be done by a few. The source of supply, the point of diversion, the lands to be irrigated, the size, length and route of the canal and the cost, are the chief features to be considered. If the undertaking seems feasible, the water may be appropriated in the legal way, and a competent surveyor employed to locate the line and submit a report with estimates of cost. A meeting may then be called for all interested parties to hear the report of the engineer. In case it is favorable and a decision is reached to go ahead with the proposed canal, a committee on organization may be appointed. The members of this committee may also act as the original incorporators of the new company.

In the Articles of Incorporation of a co-operative canal company the following features are clearly stated:

First:—The name of the company.

Second:—The objects for which the company is formed.

Third:—The stream, or other source of supply, from which the water is to be taken, the point of diversion and a general description of the route, capacity and character of the canal.

Fourth:—The amount of capital stock, and number and value of the shares.

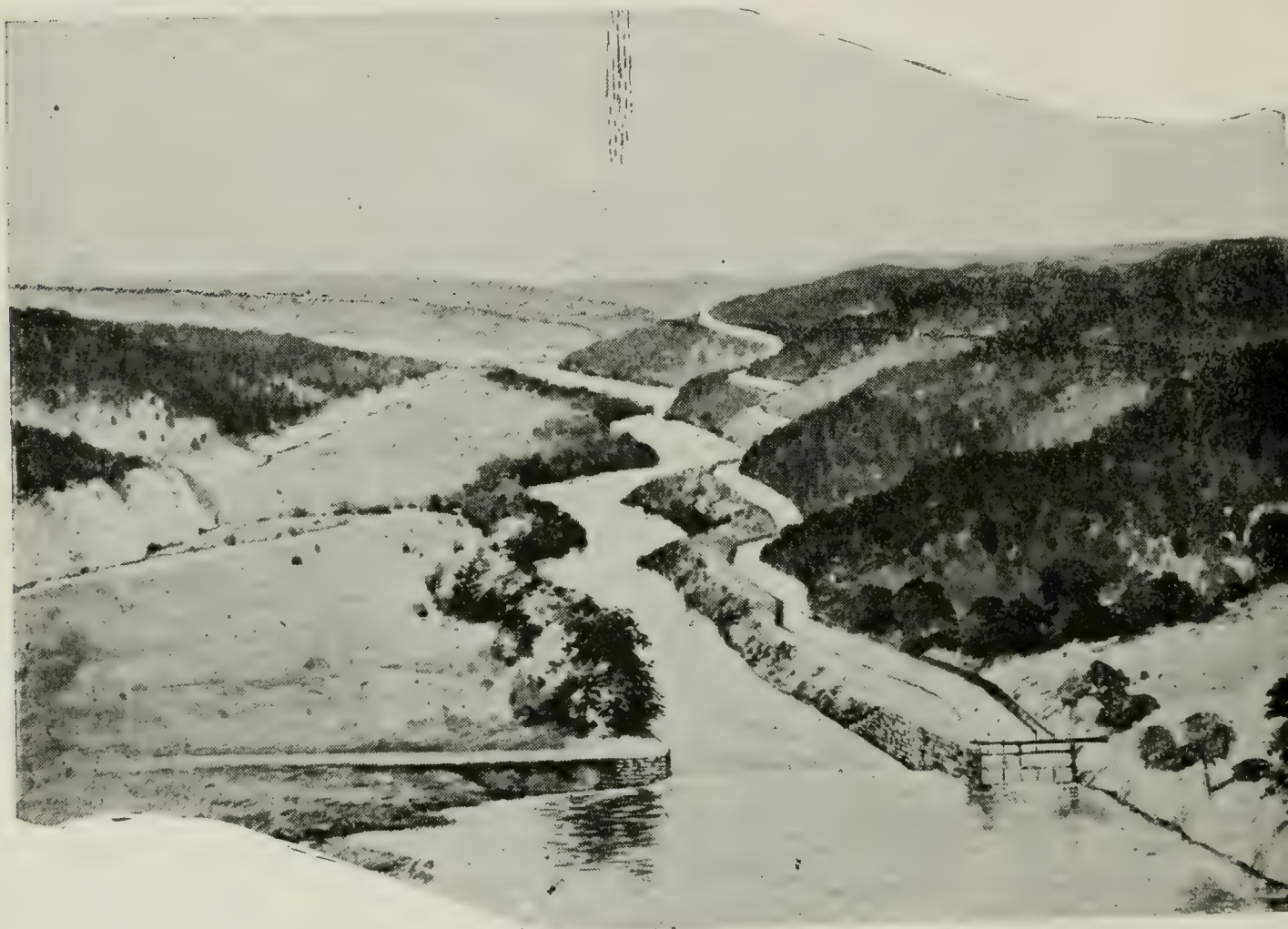
Fifth:—The term of existence of the company.

Sixth:—The nature of the governing board and the names and places of residence of the members thereof.

Seventh:—The location of the principal office of the company and the county or counties in which the company shall operate.

Eighth:—An outline of the powers of the governing board.

Ninth:—The acknowledgement.



ST. MARY'S RIVER CANAL.

An Outline of the By-Laws of the Co-Operative Canal Company.

ARTICLE I.

Board of Trustees.

Section 1. When and how elected and tenure of office.

Sec. 2. Trustees to be stockholders and residents of.....
County, Montana.

Sec. 3. How vacancies are to be filled.

Sec. 4. Regular and special meetings of the board.

Sec. 5. A quorum of the board.

Sec. 6. The duties of the board.

ARTICLE II.

Officers.

Section 1. The offices of president, vice-president, treasurer and sec-

retary, their election or appointment and tenure of office.

Sec. 2. Duties of the president and vice-president.

Sec. 3. Duties of treasurer.

Sec. 4. Duties of secretary.

ARTICLE III.

Superintendent.

Section 1. The appointment of a superintendent, his powers and duties.

Sec. 2. Ditch riders and other employees to be under the superintendent.

ARTICLE IV.

Capital Stock.

ARTICLE V.

Stockholders.

ARTICLE VI.

Section 1. Compensation of members of the board.

Sec. 2. Compensation of treasurer and secretary.

ARTICLE VII.

Assessments.

Section 1. Amount of maximum assessment that can be levied.

Sec. 2. How assessments are to be levied.

Sec. 3. The collection of delinquent assessments.

ARTICLE VIII.

Headgates.

Section 1. Every lateral or ditch, which diverts water from any portion of the canal of said company shall be provided with a substantial headgate, so constructed that it can be locked and kept closed by the superintendent.

Sec. 2. Such headgates shall be built by the company under the supervision of the superintendent in accordance with plans and specifications approved by the board of trustees. The cost of each headgate when completed and in place shall be charged to the stockholder, or stockholders, who own the lateral, or ditch, on which the headgate is placed.

Sec. 3. The company acting through its superintendent shall determine the location and number of headgates to which each stockholder is entitled.

Sec. 4. During the irrigation period no person other than the superintendent or his duly appointed agent shall be permitted to interfere with any headgate on the canal of said company for the purpose of increasing the flow in the lateral controlled by such headgate.

Sec. 5. No stockholder shall be permitted to insert any dam or other obstruction in the channel of said canal without the written consent of the superintendent.

ARTICLE IX.

Measurement and Divison of Water.

Section 1. The volume of water diverted by said canal shall be expressed in cubic feet per second, and each cubic foot per second shall be equivalent to forty Montana miner's inches.

Sec. 2. The loss due to leakage, seepage and evaporation along the entire length of the canal of said company shall be determined by the superintendent or other competent person. This loss when approximately determined shall be deducted from the total volume diverted, and the balance shall be divided pro rata among the stockholders.

Sec. 3. A rating flume, weir, or other measuring device, shall be built

when required by the superintendent in accordance with the plans and specifications approved by the board of trustees and placed near to the headgate as is practicable. The purpose of such measuring device shall be to assist the superintendent in apportioning equitably the available flow of the canal among the stockholders and the cost of said device shall be borne by the owner or owners of the lateral in which it is inserted.

Sec. 4. The superintendent is forbidden, unless under the written authority of the trustees to deliver water to any stockholder who fails to pay his assessment when ordered, or who fails to maintain a substantial headgate or measuring device, or who violates without sufficient recompense any of the rules or by-laws of this company.

Sec. 5. Any disagreement arising between the superintendent and stockholders upon any matter not provided for by these by-laws may be decided by any three trustees, whose decision shall be binding, subject, however, to an appeal to the board of trustees.

I have written in full Article VIII on headgates and Article IX on the measurement and division of water to avoid, if possible, misunderstandings on these subjects. The by-laws or rules of the company may also include provisions as to the manner of building and paying for the canal. Such canals are usually built in one of two ways. The company employs a superintendent or foreman under whom the work of each stockholder is performed. The weak feature of this system is that one stockholder will bring a poor team, with old harness and a worn out scraper, and expect to receive as much compensation for his day's work as another stockholder who brings a good team, well equipped for work. Some stockholders are forgetful. They imagine that they are working out their road tax and that to hurry would be a crime. In the other system the line is cross-sectioned. In other words, the number of cubic yards in each 100 foot length of the canal is determined. The company fixes a price on each class of material, such as earth, loose rock and solid rock. A certain length of the canal is then apportioned (it may be by lot) among the various stockholders who are credited with the number of cubic yards which each removes. The work is all done under a competent supervisor and each sub-contractor must comply with the rules and regulations of the company.

THE BUILDING OF SMALL STORAGE RESERVOIRS.

The Bureau is also indebted to Director Fortier for the following paper written under the above caption:

Compared with other western states, Montana is well watered. The heavy snowfall on the high mountain ranges provides an abundant water supply for the principal river basins. There are, however, numerous smaller tracts of fertile land that are dependent for their supply on the mountain creeks. These creeks usually carry many times more water during the flood period in the spring than in the latter part of the irrigation season. The channels of many of the smaller creeks are dry in July.

In order to utilize to the fullest extent possible the fertile bench lands of the state, much of the water used after July 1 of each year will have to come from storage reservoirs. The history of most of the irrigated countries indicates this fact. In India, for example, for every three acres irrigated from natural streams, four are irrigated from storage reservoirs.

In Montana that stage of irrigation development which one might term reservoir building is just beginning. It is safe to state that more earthen reservoirs have been built during the past year than during any five years since the state was first settled. In a comparatively short time we may expect to find a large number of such reservoirs. Some of these will be built with the one object of supplying water to land, others of supplying water to stock, while a third class may subserve both these purposes. The utility of such structures will depend to a great extent on the manner of building. The irrigated West is dotted with old dam sites, resulting from ruptured earthen embankments. In most instances such failures might have been averted by the exercise of a little care and skill in building the dams. The purpose of this brief article is to offer a few suggestions that may aid farmers to build secure earthen dams.

Few general rules can be given on this topic. Those hard working little engineers, the beavers, have usually pre-empted the best sites. A beavers' meadow is commonly a good site for a storage reservoir, providing its outlet is narrow. The main requisites of a good site may be named as follows:

The bottom of the proposed reservoir to be above the land to be irrigated and within a reasonable distance of it. The dam site to be narrow so as to lessen the cost of building an embankment. The reservoir site to be comparatively flat and wide in order to increase the quantity of water stored. The materials on the side to be of such character as to admit of being rendered impervious.

Figuring Out the Capacity.

An engineer's level is to be preferred in making the first trial survey. Any intelligent farmer may find out for himself the probable holding capacity of a reservoir site by means of an ordinary rule and a carpenter's spirit level.

Let him stretch a cord, to which another cord is attached by means of a ring to its center, across the proposed dam site at the level of the height of the water to be stored. Level the horizontal cord by the spirit level and mark both ends. Then find by measuring the second cord the distance of the first above the ground. This distance would represent the depth of water in the reservoir. Then let him place the spirit level, in turn, at each of the points formerly marked as representing the surface of its water and fix several points around the reservoir site. Observe that these points represent the highest to which the water would rise if the reservoir was filled. From these points a rough estimate can be made of the area of the water surface in square feet. To find the capacity in cubic feet it will be sufficiently accurate in all small reservoirs which slope on all sides uniformly towards the dam site, to multiply the surface area in square feet by one-third the depth of water in feet and the result will be the contents in cubic feet.

For example, assume that the reservoir when full will be 1,000 feet long and will average 500 feet in breadth. Multiplying the length by the breadth the product is 500,000 square feet. Now assume that the depth is 21 feet, taking one-third of this and multiplying it by the surface area, the result

is 3,500,000 cubic feet. Dividing this figure by 43,560, the number of square feet in an acre, we get a trifle more than 80, that is to say, the reservoir under consideration would store sufficient water to cover one acre 80 feet deep, or 80 acres one foot deep.

Engineers usually ascertain the contents of a proposed reservoir by running what are termed contour lines from one to ten feet apart in vertical distances around the site. They compute the number of cubic feet in each horizontal layer. The rough rule which I have given errs on the side of safety as it gives less than the actual in nearly every case.

In the example given of a reservoir holding sufficient water to cover 80 acres one foot deep, the extent of land which it would irrigate would vary from about 40 to 80 acres.

Clearing the Site.

All brush, weeds, and everything liable to decay should first be removed from the site of the dam. The surface should then be plowed deep and thrown up in ridges by the plow. It is moistened before the first layer of earth is placed on top of the original surface.

Digging a Trench.

It is well to dig a trench across the gap to be dammed, beneath the center of the embankment. This trench should not be less than four feet wide, and should be extended down until a safe, impervious stratum is reached. It is then filled with water and the scrapers or wheelers containing good puddling earth are dumped into the water. A mixture of clay, sand, or gravel makes a good puddle. The trench should be extended into the side hill at each end of the embankment.

Laying the Outlet Pipe.

Use cast iron pipe for the outlet. It is made in lengths of 12 feet when laid. The following table gives the weights for medium weight pipe:

Size.	Weight.
6 inch pipe	35 pounds per foot
8 " "	50 " "
10 " "	67 " "
12 " "	87 " "
16 " "	132 " "
20 " "	184 " "

The price in car load lots at the nearest railway station will be from 2 to 2 1-2 cents per pound. If only a few lengths are required it would save money to buy them from a city waterworks company, and secure the services of a good pipe layer to caulk the joints. Lay the outlet pipe on a grade of at least 1-2 inch to the rod. Purchase, with the pipe, a standard water works valve, such as the Ludlow, with vertical stem attached. Place this valve on the upper end of the pipe, run the stem up three feet above high water in the reservoir and operate the valve by a hand wheel from a platform built out from the embankment. Place bulkheads of puddled clay, or better, Portland cement concrete, around the outlet pipe at two or more places to prevent the water from finding a passage outside the shell of the pipe.

Dimensions of the Embankment.

The top of the embankment should be from 10 to 20 feet wide, depending on the depth and size of the reservoir. It is usually raised from three to six feet above the high water line in the reservoir. The outer, or down stream pipe, is usually made steeper than the inner or water slope. The former should slope at the rate of two feet horizontal to one foot vertical, and the latter 2 1-2 horizontal to 1 vertical.

An embankment 25 feet high, to store 21 feet of water, would have about 20 feet of a top width and the base would be about 132 1-2 feet in all.

Building the Embankment.

It is a bad practice to build the embankment with dry material. The quantity of water which it absorbs under a full reservoir head is so great as to render the dam unsafe. The usual practice is to place the earth in layers of about four inches in thickness, and to moisten each layer before the next is put on.

In the larger class of earthen dams a grooved roller is drawn repeatedly across each layer. When such a roller cannot be procured, the passage of teams from end to end of the embankment tends to compact the earth. Mention has already been made of a trench filled with water. It is a good plan to convert this trench into a kind of a canal in the middle of the embankment. Good material is dumped into the water of the canal and its bed is raised as the dam is built. This method ensures about 10 feet in breadth along the center if being well puddled.

During the construction the top of the embankment presents the appearance of two fills with a canal between. The finer and more impervious materials are dumped on the inner fill and the coarser material on the other. Large rocks, or boulders, are placed near the outer edge. The earth on the inner embankment should be spread over surface in thin layers and watered.

Protecting the Water Slope.

The water slope of an earth dam needs to be protected from wave action. This is sometimes effected by means of bundles of willows bound with wire and anchored with rock and barbed wire. At other times round poles are used. The best cheap slope paving consists of a layer of coarse gravel, or broken rock, from six to nine inches thick, and over this a layer of rock about the size that one man can lift. The paving stones are placed like shingles on a house, except that they are tipped towards the embankment to prevent them from sliding out.

Providing a Waste Way.

Some channel must be provided to carry the water past the dam when the reservoir is full; otherwise the water will overtop the dam and destroy the entire structure. It occasionally happens that a low ridge at some distance from the site can be graded down to the level of the water in the reservoir. Generally, however, a canal has to be excavated along the hillside near one end of the dam. This canal should be made V shaped at the upper end on as steep a grade as the nature of the material will permit. It should be of ample capacity to carry all the water that flows in the stream during the greatest flood.

Puddling the Bottom.

Many a reservoir is of little use on account of the large seepage loss from the bottom and sides. The seepage from the bottom may be almost wholly prevented by puddling. When the reservoir is small and used in part for a domestic supply, it frequently pays to haul pulverized clay and spread it over the bottom and for some distance up the sides. It is then moistened and rammed. A layer of gravel spread over the moistened clay and rammed flush with the surface is very effective.

If the stored water is only used for irrigating, the new reservoir may be made a feeding ground for sheep. A very thin layer of clay, when moistened and well packed into the natural soil by the feet of sheep will make a lining that is nearly water tight.

FARMERS' WEIRS.

For the benefit of users of water the following is taken from Bulletin No. 34, issued by the Montana Experiment Station:

During the crop growing season the irrigators of Montana divert large volumes of water from the natural channels of the stream. When the natural supply is limited to the flow of a small creek a few farmers may convey the entire amount through small ditches. When the stream is large a score or more of canals, each supplying water to hundreds of farmers, may be in use. In all cases other than exclusive individual ownership the equitable division of irrigation waters is a necessity.

For a long period after the first settlement of the fertile valleys of the state, water was abundant and little attention was paid to accurate measurements, or a just division. In some favored sections these conditions still prevail. So long as water for irrigation is cheap and plentiful western farmers, as a rule, do not trouble their minds about either irrigation laws or measuring devices. Until March 12, 1885, Montana had no legal standard for measuring water in motion. In that year the legislature enacted the following:

"Sec. 1262. The measurement of water appropriated under this chapter shall be conducted in the following manner: A box or flume shall be constructed with a head gate placed so as to leave an opening of six inches between the bottom of the box or flume and the lower edge of the head gate, with a slide to enter at one side of and of sufficient width to close the opening left by the head gate by means of which the dimensions of the opening are to be adjusted. The box or flume shall be placed level, and so arranged that the stream in passing through the aperture is not obstructed by back water, or an eddy below the gate; but before entering the opening to be measured the stream shall be brought to an eddy, and shall stand three inches on the head gate and above the opening. The number of square inches contained in the opening shall be the measure of inches of water."

From 1885 to 1898 the miners' inch box just described was the only legal method of measuring irrigation water and the court decrees of that period in relation to all water right suits are expressed in Montana statutory inches.

This box which was designed to measure miners' inches consisted generally of a short flume having a bottom and two sides. At the upper end a board three inches wide was fastened six inches above the top of the floor. The opening formed between the lower edge of the board and the floor was controlled by a slide, or gate, which moved horizontally. When the box was in place the irrigation stream to be measured was turned on and the

slide so adjusted that the surface of the water at the upper end of the box was level with the top of the three inch board. It was an easy way of measuring water under a six inch pressure, for the distance from the top of the three inch board to the center of the opening was intended to be six inches. In measuring a stream if the slide were drawn out 15 inches at the time the water was level with the top of the three inch board the opening thus made would be six inches high and 15 inches long and contain 90 square inches. The amount of water flowing through this opening of 90 square inches under an average head of six inches would represent 90 miners' inches.

This method of measuring water has been severely criticised by the engineers of the state. Their objections may be summarized as follows:

- (1) It is not accurate.
- (2) It can only be used to measure small streams.
- (3) It is not adapted to continuous measurements.
- (4) It favors the large consumer.
- (5) The flow may be considerably increased or diminished by slight changes.

(6) Miners' inches vary in quantity in different localities of the West. In 1899 the state legislature established a new standard unit, defined the Montana miners' inch and repealed all laws in conflict therewith.

This law is as follows:

Section 1. Hereafter a cubic foot of water (7.48 gallons) per second of time shall be the legal standard for the measurement of water in this state.

Sec. 2. Where water rights expressed in miners' inches have been granted, 100 miners' inches shall be considered equivalent to a flow of two and one-half cubic feet (18.7 gallons) per second; 200 miners' inches shall be considered equivalent to a flow of five cubic feet (37.4 gallons) per second, and this proportion shall be observed in determining the equivalent flow represented by any number of miners' inches.

Sec. 3. Provided, that the provisions of this bill shall not affect or change the measurement of water heretofore decreed by court, but such decreed water shall be measured according to the law in force at the time such decree was made and entered.

Sec. 4. Section 1893, Title VIII., Part IV., Division II. of the Civil Code of the State of Montana, and any laws in conflict with this act are hereby repealed.

Approved March 3, 1899.

Definitions of Terms Used in Irrigation and the Measurement of Water.

Cubic Foot per Second.—The standard unit for flowing water in Montana as well as in most of the western states and territories, is a solid or cubic foot of water, moving at the rate of a lineal foot in one second of time. Each foot in length of a flume one foot wide and one foot high, inside measurement, and flowing full of water, would contain a solid or cubic foot of water. Now, if this flume were placed on such a grade that the average rate of flow of water within it would be just one foot of distance for each second of time it would carry a volume equal to the standard unit. This unit is often abbreviated into the two words, "second-foot."

In considering this standard for flowing water, irrigators should not conclude that a volume of a certain definite size is necessary. It will be apparent to all that a flume six inches wide and six inches high full of water flowing at the average rate of four feet per second would also deliver one cubic foot per second. In general, the flow of any stream may be obtained by multiplying the width and depth of the water channel in feet by the average rate of flow in feet. A flume, for example, which is six feet wide inside and carries water to a depth of one and one-half feet would contain $6 \times 1 \frac{1}{2}$

or nine square feet of water area. Now, if it is found that the average rate of flow is two feet per second the total volume is 2×9 , or 18 cubic feet per second. In the case of a ditch in earth with a curved bottom the area is not so readily found, but the principle involved is the same.

Montana Miners' Inch.—Like the bushel measure for grain the term miners' inch is likely to be continued long after that method of water measurement has been abandoned. I do not know of a single Montana farmer that now measures his grain by means of a bushel measure and yet the large majority indicate their yields in bushels per acre. Scales of all kinds have now become so common that the old fashioned measure of our grandfather's time is no longer used. There have been like changes in the devices used to measure water and while we still retain the term miners' inch we seldom ascertain the flow by the miners inch box. For small streams of water such as are applied to orchard tracts the miners' inch is a convenient unit and there are advantages in continuing its use. In adopting a new standard the members of our state legislature foresaw the extended use of the old unit and so defined it in accurate terms. Forty (40) Montana miners' inches are the exact equivalent of one cubic foot per second. An irrigation stream containing 80 miners' inches would be described as two second-feet by the new standard, one containing 120 miners' inches as three second feet, and so on.

Acre-Foot.—The second-foot and the miners' inch can only be used for water in motion. It is often convenient in irrigation to describe a certain volume of water in a state of rest. The cubic foot might have been adopted for this purpose had it not been too small. It would have been but a drop in a bucket when compared with the large quantities used in irrigation. Accordingly the acre-foot has been quite generally adopted.

This unit represents the quantity of water which would cover an acre to the depth of one foot. Since there are 43,560 square feet in an acre, an acre-foot contains 43,560 cubic feet. Rainfall is measured in depth over the surface and of late years the tendency has been to measure water for irrigation in the same way. One frequently hears it stated by practical irrigators that forty acres of spring wheat will require forty miners' inches. But this statement conveys no definite idea as to the actual amount of water applied to the wheat field because the number of days the stream has been allowed to run on the field is not given. When, however, one states that 60 acre-feet were applied in two irrigations it shows that a certain definite volume of water was used during stated periods and that this volume was sufficient to have covered the 40 acre field to a depth of 1 1-2 feet.

One Irrigation.—How much water does it require for one irrigation? The amount will, of course, vary with a score or more of conditions. It may interest the reader to know that of 44 experiments made by this station in different parts of Montana the average was 10 inches of water over the surface irrigated. This amount included all waste incurred on the field but did not include the losses in conveying the water from the natural channel to the borders of the field. The writer has found that with well made field laterals and skilled irrigators six inches of water will suffice to wet the soil to an average depth of one foot.

The Standard Unit and the Acre-Foot.—Irrigators frequently wish to convert running water into volumes. It may interest them to learn that a second-foot, or 40 miners' inches, flowing on an acre for one hour will cover it to a depth of one inch. If this stream is allowed to flow on an acre for a day it will cover it to a depth of two feet. This rule is not quite exact, but may be used in general practice.

Irrigation Water Should Be Measured.

Throughout the irrigated portions of Montana, 40 acres of land with 20 miners' inches of water will produce more than 80 acres without water. If

this be true, and the statement would seem to be extremely conservative, a miners' inch of water apart from the cost of irrigation is equal in value to two acres of land. Still one finds that land is measured and mapped and when sold the purchaser is careful to see that the deed is valid and properly recorded. Whereas, in the case of irrigation water probably less than 5 per cent of the total volume used in the state has ever been measured.

The New Standard.

I am often asked to explain the new way of measuring water. The Montana legislature has prescribed no new method. It has merely adopted a standard unit in which all volumes of running water are hereafter to be expressed.

The same legislative assembly might have adopted the hundred weight as the standard unit for the sale of all grains and defined the bushel as equivalent to 50 pounds. Such a law would not have compelled farmers to use a particular make of scale or prevented them from using the bushel measure. The citizens of the state may measure irrigation water by any accurate method, providing the results are expressed in cubic feet per second.

Current Meter Measurements.—Of late years small instruments called current meters have been manufactured by several firms at prices ranging from \$50 to \$200 each. These meters indicate the velocity of the water in any open channel and the mean velocity when multiplied by the area of the section gives the discharge. This mode of measuring water has become quite popular owing to the ease and rapidity with which it can be done and also to the fact that fairly accurate results can be obtained without the use of flumes, boxes, or other devices.

Rating Flumes.—For occasional measurements the earthen channel of a ditch, or canal, answers all purposes but when more accurate and continuous measurements are desired rating flumes are usually constructed.

These consist of wooden flumes as wide as the water channel and from 8 to 24 feet in length, placed to conform with the grade of the canal. The velocity of the water is found by a current meter and the depth of water is often recorded on a sheet attached to a self-registering machine which needs attention only every seventh day.

Full instructions for constructing and taking measurements with weirs are given in bulletin No. 34, which should be in the hands of every user of water. Exhaustive tables are also given showing equivalents in miners' inches of different lengths of weirs which will be found valuable. To obtain this bulletin write to Director S. Fortier, Montana Agricultural Experiment Station, Bozeman, Montana.

STATUS OF PRESENT WATER RIGHTS.

Even a cursory examination into the irrigation laws and methods of Montana reveals a condition of affairs that may well cause alarm for the future of agriculture, and which must lead to the inevitable conclusion that some adequate remedy must be speedily sought for and applied, or the users of water will become involved in inextricable confusion, and the greater portion of the time of the courts taken up in hearing vexatious questions concerning water rights. At present the chief trouble seems to arise from a lack of definite and accurate knowledge of the amount of water in the various streams suitable for irrigation projects. A brief examination will show that the entire volume of many streams has been located over and over again, and where the streams traverse more than one county, the locations have

been duplicated to such an extent that the water rights call for an amount of water many times greater than the flow of the stream even during the spring freshets. To remedy this deplorable condition of affairs provision should at once be made for an official measurement of all streams and water courses in the state under the direction of a competent engineer; and following this there should be an adjudication of all water rights, beneficial use alone confirming the title to water, and such title to be always connected with the title to the land. These matters should be established by legislative enactment, similar to that of Wyoming and other states, a synopsis of which is given, taken from the report of the State Engineer of Idaho. The status of water rights in Idaho are very similar to those of Montana, and for this reason, in addition to a synopsis of the Wyoming law, a very liberal quotation is made from this report in which the system of the administration of water for irrigation purposes is ably discussed.

Extract From Idaho State Engineer's Report.

The present system for the administration of our streams can scarcely be called a system; it is not even up to the standard of the cast-off laws of our sister state, Wyoming. The authority for it exists in a patch-work of laws which begin and end nowhere, and take no account of the natural conditions which render irrigation necessary. As a result, practices have been established which are directly opposed to the fundamental principles which underlie customs, followed elsewhere in the administration of the public waters, as old as the art of irrigation. Starting out with a declaration of the right of the state to control streams, we have ended with an impression prevailing in the minds of many that they become private property as soon as a water location notice is posted on their banks. The quantity claimed depends in most cases upon the fancy of the appropriator. He is as likely to claim "10,000 second feet" flowing in "Dry" creek as "100 cubic inches per second" flowing in Snake river. While a right to water is the necessary complement of every acre of land before it can be cultivated and therefore has any real value, it is held in this state that a personal property interest exists in this right which may be sold or changed about to other land, or may be levied on as something apart from the land to which it is beneficially applied.

First in time, first in right, is the principle by which the prior right of the appropriator is determined; the capacity of the canal or other diverting works measures the extent of the right, while beneficial use gives the right to a continued use of the water. These are the fundamental principles by which courts are guided in this state in determining priorities and extent of water rights, the soundness of which no one questions for a moment. Let us consider now with what exactness these rights are determined.

Irrigation and litigation on some of our streams are sometimes thought to be synonymous. The litigation is the culminating feature of neighborhood disputes and quarrels over the division of water. These disputes are not over the principles involved in the matter, although it is true that the right to a certain quantity of water may in the controversy be based upon the priorities of the disputants, but the practical question is the getting of the quantity claimed. Our system for the adjudication of water rights and the administration of the stream after its allotment is wholly under the jurisdiction of the courts. We have imposed the duties of head water-master upon our district judges, whose training has certainly not specially

qualified them for this important work, to say nothing of the time required, which must be given at the expense of other interests.

Now water must first be flowing in the streams before any one can use it, and the quantity used will, of course, depend upon the supply available. The exact quantity used by each irrigator will, therefore, always vary with the supply in the stream. The flow of the stream is never the same, but will vary from day to day and from year to year. The volume awarded each user by the court in the allotment of the stream is specific, is supposed has never been determined. This specified amount is to be diverted from a supply which has never been measured and which, as previously stated, varies from day to day. The volume allotted is expressed in a unit whose value varies according to the device employed in its measurement, the specifications for the construction of which the court does not pretend to prescribe. In many cases the quantity awarded bears a certain relation to the acreage cultivated, the user being allowed its continuous flow during the irrigating season, although it will only be applied to the fields intermittently. Sometimes the head thus awarded is so small as to be worthless. In this way the stream has been divided into innumerable little threads, each becoming still smaller through seepage and evaporation. While the irrigator may have been given the right to the continuous flow of this small amount of water, no special privilege was conferred thereby, for, as before stated, irrigation with serviceable heads is not carried on continuously but intermittently, and the little stream does not possess the power to accumulate and deliver itself at intervals in a proportionately increased volume. In this manner the oldest custom known in the history of irrigation, rotation in the use of serviceable irrigation heads, the very cornerstone in the administration of a scant water supply, has been not only ignored, but has been completely discouraged. The result of this is far reaching; many individual ditches are used when one community ditch would suffice, the natural loss from seepage and evaporation being thus multiplied many times; the appropriators selfishly stand on their individual rights established in this manner by the court, instead of standing together through community interest in the common water supply.

Precisely this state of affairs would exist under any administrative system of our public land department were it based upon the right of the individual to appropriate whatever portion of the public domain he might desire, afterwards settling without surveys the disputes over the overlapping claims which would result, allowing each litigant to adopt his own standard and method of measurement. The confusion, though, would not be as great as under our present water system, for while the area of all the tracts claimed might be greater than the whole body being divided, the extent of the domain being thus allotted would never vary from time to time as does the water supply, which disappears entirely at intervals.

In the determination of the rights of users to the waters of a stream according to the three principles relating to priority, quantity, and right to continued use, the following facts should be known beyond any peradventure of a doubt: (1). The date of appropriation; (2), the date of the construction and completion of the ditch; (3), the capacity of the ditch at its completion; (4), the date of the first use of water; (5), the description of the land to which it was applied; (6), the date of subsequent enlargements of the ditch. The essential conditions of the right to use water should be: (1), The dedication to the land (being fully described) of the right to a quantity of water during each irrigating season, which, after making due allowance for unavoidable losses, if distributed evenly over the surface, will have a depth equal to the rainfall required to produce agricultural crops in the vicinity. To deliver this amount of water it is

not necessary that the irrigator shall have always at his disposal a volume, the equivalent of a continuous downpour of rain in the tropics; neither should it be delivered to him in such quantities that its effect will be in the nature of a drizzling rain; but its delivery should be in such heads, to be delivered at such times, as will be best suited to the conditions of soil, crops, etc. There will scarcely be enough water in the stream to give every user the equivalent of a tropical downpour throughout the season; although there might be sufficient to give one the equivalent of a drizzle; but if the common supply is intelligently distributed, every user will have placed at his disposal a quantity which will have the effect of well regulated rains, while the various rights will at the same time be fully respected. By this means the smallest subdivision of land will have as efficient a water right as the largest, for the opportunity of following the universal practice of rotation among the small users will thus have been preserved. (2), The right to this water as long as it can be beneficially applied to the land. If the duty of the water is raised through an efficient administration of the natural water supply, or through the gradual change in the character of the stream which always takes place through long continued use, the quantity saved or added through any such means should belong to the public, to be disposed of to later users, gradually bringing all the rights on the stream up to the same standard. The dedication of the right to the land of an amount sufficient for agricultural purposes when applied with economy, is the full right and complement of the land. There could then be no interest in a surplus or unused right, for no such right would exist.

The next and perhaps the most important feature of the irrigation problem is the administration of the stream and the system of distribution, so that each irrigator may obtain his full share of water. The list of the allotments and priorities is simply the authority, the question being: How are the many claimants to obtain their proportion? The stream in many instances is from 10 to 100 miles in length; the flow is varying continually, the farmer at the lower end cannot obtain his supply unless the gates above are properly adjusted at intervals, and he cannot afford to patrol the stream. There is but one practical way in which the flow through each gate can be regulated, waste stopped, and all the users obtain their proportion according to their rights, namely, public control. The administration of the stream should be in the hands of a public officer, whose duty it should be to open or close any or all gates, apportion the irrigating heads among the large users, and devise a system of rotation among the smaller users. This public officer should be vested with full police powers, for the infraction of just rules by an irrigator must be promptly met, or the damage done, which begins at once, may prove fatal to large interests. A perfect but simple system of measurement should be the basis of any division of waters, not only the amounts delivered to each irrigator, but the volume flowing in the stream, which should be measured at several points.

Now what is the basis of such a system of administration as this where the adjudication of rights will be based upon evidence backed by a full knowledge of all the facts relating thereto, and obtained by disinterested persons, and the distribution of the waters thereafter be based upon careful measurements, and conformable to the natural conditions of each stream and place of use? Believing that a great deal has already been lost through our attempts at working out a system of our own, if it can be called such, it would be a great presumption on my part to offer any untried plan as a solution of these difficulties. I have therefore outlined instead, a system which has stood the test for 10 years in a sister state, and has been adopted by other states and foreign countries. This is the Wyoming system

for the public administration of irrigation.

The Wyoming system provides for the office of state engineer, whose duties are, among others, to measure the flow of the streams used for irrigation. When it is desired to appropriate water for irrigation or other purposes, the would-be appropriator first applies to that officer for a permit. In the application, all his plans relating to the quantity of water, size of ditch, use, and place of use are fully described; and when the ditch is of a considerable size, a map of the survey of the same, showing all the lands to be watered, accompanies such application. A careful investigation is made, and, if the plans are proper and the diversion of the water is not opposed to the public welfare, the permit is at once issued. By submitting such plans to the state engineer for his approval, ridiculous claims and absurd plans will no longer encumber the public records. A record is made in his office of these applications and permits, also the date of beginning the construction of the diversion works, the date of their completion, or subsequent enlargement. When the works are completed or enlarged, their capacity is carefully measured and recorded.

For the purpose of carrying out a system for the administration of the public waters, the state is divided into four districts, each in charge of a superintendent. The districts are again subdivided; each of the subdivisions being placed in charge of a water commissioner. The water commissioners and their assistants, when they are necessary, have immediate charge of the distribution of the waters of the streams. These districts and divisions are of course, made to conform to natural divisions of the drainage basins of the state. All these water commissioners are vested with full police powers and are personally responsible for the accurate distribution of the water according to the allotments made.

The four district superintendents with the state engineer constitute the state board of control, and have full authority to determine the priority of the rights of the water users. Before attempting to do this, however, careful measurements of the streams are made; and of every ditch diverting water from the same; also of all the land watered by each of these ditches. Careful surveys are made when necessary, to determine these very essential features; and when all these important facts have been gathered, the users of water are given notice that upon a certain day they will be required to submit evidence before the superintendent of that division relating to their use of water from the stream. Since the facts for the determination of the priority of each right, as well as the quantity which each appropriator is using, have been obtained in advance by the state, it is an easy matter to adjust the various claims. When the determination is made a certificate is issued to each appropriator by the board of control which is the evidence of his right to use the water.

One great advantage of this system is that the adjudication is initiated by the state, on the same principle followed in a local land office in fixing a date for taking evidence in making final proof on a land claim. Another advantage is, that the board of control consists of men who thoroughly understand, not only the practical features of irrigation, but have at all times the co-operation of those having knowledge of the technical features of the question; a knowledge which is absolutely essential in order to properly sift the facts bearing on each case. The proceedings are informal, and are held at a point within convenient reach of all concerned; while the expenses are merely nominal. The constitutionality of this law was assailed in the case of *Farm Investment Co. v. Carpenter et al.*, 61 Pac. 358. The system was upheld in every point by the supreme court of Wyoming, the opinion of

that court answering the objections usually raised against it by those who are being profited the most in this state under our present system. In order to lay before the irrigators of this state information regarding the effectiveness of this system of adjudication, I addressed the following letter to the State Engineer of Wyoming:

Boise, Idaho, Dec. 14, 1901.

Hon. Fred Bond,

State Engineer, Cheyenne, Wyoming.

Dear Sir: I shall be greatly obliged if you will kindly inform me how many ditch rights have been settled under your system of adjudication since the law went into effect, and the number of appeals taken: (1) to the full board of control; (2), to the district court; and (3) to the supreme court of the state. Also the average cost to the ditch owner of such adjudications.

Very respectfully,

D. W. ROSS,

State Engineer.

The information contained in Mr. Bond's reply to the above letter would indicate that the ditch owners of Wyoming are at any rate satisfied with the system.

Cheyenne, Wyoming, Dec. 17, 1901.

Hon. D. W. Ross,

State Engineer, Boise, Idaho:

Dear Sir: The number of ditch rights which have been determined by adjudication of the Board of Control and final certificates issued up to November 3 oof this year is 3,887. An appeal from the superintendent to the full Board of Control is unknown on our records. There has been one appeal from the Board of Control to the district court, in which the decree of the board was sustained by the court. I do not think there have been any other appeals. There has been no appeal from the Board of Control through the district court to the supreme court. The three cases which I believe have reached the supreme court, came up from the district court on other matters than the decision of the Board of Control.

As to the average cost of an adjudication to the ditch owner, we have no data. He is required to pay \$1 for a certificate and 75 cents to the county clerk for recording fees, and outside of this has no expenses, except what may be necessary for him to appear before the superintendent and make proof.

Very truly yours,

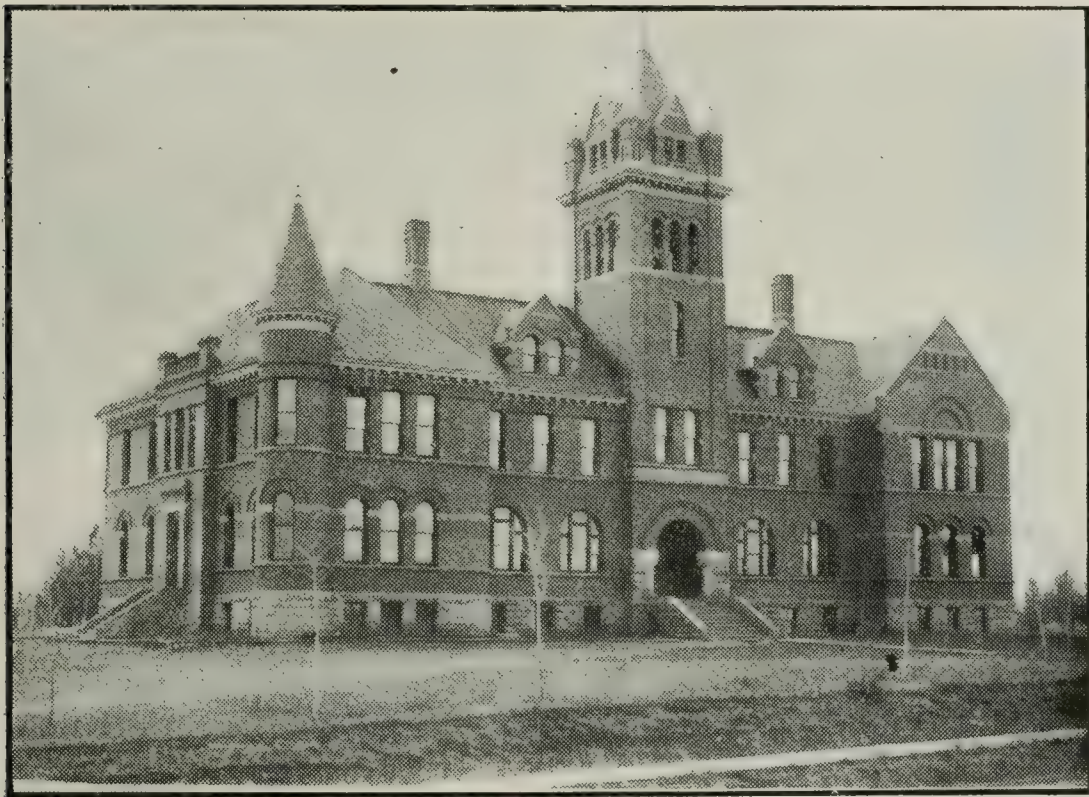
FRED BOND,

State Engineer.

The importance of establishing a better system for the adjudication of water rights and administration of streams cannot be overestimated. A glance at the claims to water recorded during the past six years should be sufficient warning of the trouble yet in store. Has our present system afforded any relief? Ask the farmers! And the litigation of the past few years has been but a skirmish compared with what is in store for us under our present methods. Some are disposed to regard this as an unimportant matter; but all should remember that our water supply is limited, while the land to which it may be applied is in comparison without limit. We are now but few in numbers; this question has already been a source of trouble for many years, and as our numbers increase, the interests thus involved become greater. We must either inaugurate a more comprehensive system for the administration of our water supply, or, instead of inviting others to assist in developing the agricultural resources of this part of the state, we will soon be looking at the new comer with suspicion; regarding him as an

interloper, as he is already regarded on some of our streams.

There will doubtless be suggestions regarding further legislation on this question. To expect relief through any amendment of our present laws is bound to lead to disappointment and still more serious complications. Let us have the best system that can be had. We cannot do better than to adopt the system which has been in such successful operation for the past ten years in Wyoming.



HIGH SCHOOL, BOZEMAN.

EXPERIMENT STATION IRRIGATION WORK.

A vast amount of preliminary work has been done by the United States government under the Department of Agriculture, having for its object the starting of practical operations contemplated in the National Irrigation law. This work has been under the immediate supervision of Mr. Elwood Mead, who is very naturally interested in having the greatest amount of publicity given to the methods and scope of the investigations. To this end Mr. Mead has sent the Bureau the following letter and monograph concerning the matter which are here reproduced:

UNITED STATES DEPARTMENT OF AGRICULTURE,

Office of Experiment Stations,

A. C. True, Director.

Irrigation Investigations,

Elwood Mead,

Irrigation Expert in Charge.

Washington, D. C., September 22, 1902.

"Dear Sir:—We are sending you a reprint from the report of the Office of Experiment Stations, which deals with the Irrigation Investigations conducted under the direction of this Office. It is hoped that it may have something of interest, because it is desired that the objects and methods of these investigations be generally understood, in order that the results may have a wide dissemination and be of the greatest possible practical use.

"In the arid region the irrigation industry needs to be organized, and the work of this Office has for its object the gathering of facts on which irrigation practices and institutions should rest. The most urgent need of that region is additional knowledge of the best methods of distributing water and applying it to crops in order that skill and economy may be promoted. In its studies of social and economic questions, the Office aims to bring about the settlement of rights to streams by some less costly and uncertain method than lawsuits, and to promote such improvement in State laws as will insure the just and efficient division of streams among those who use them.

"One of the important results of the work already done has been to bring about a co-ordination and co-operation between the State agencies now working to promote the extension and success of irrigation. Through this work the independent investigations of the State experiment stations and the State engineers' offices are being brought together, the methods of research are being made more systematic and effective, and unity and harmony secured in working out the unsettled problems of irrigation.

Sincerely yours,

ELWOOD MEAD,

Chief of Irrigation Investigations.

THE SCOPE AND PURPOSE OF THE IRRIGATION INVESTIGATIONS OF THE OFFICE OF EXPERIMENT STATIONS.

With relation to rainfall the territory of the United States is divided into three parts—the humid, the subhumid, and the arid. In the humid region the rainfall is ordinarily abundant, but there are occasional seasons when it is insufficient for the raising of crops, and in most seasons there are times

when crops are checked in their growth by periods of drought lasting from a few days to a few weeks. The subhumid region includes the territory where dry periods in summer are the rule. The injury to crops in subhumid regions is due to two causes—insufficient moisture and great irregularity in its distribution. The arid region includes the areas where cultivated crops can not be grown by the aid of rainfall alone.

Geographically, these regions are arranged from east to west, although no exact line can be drawn separating them. The humid region, as generally described, includes all of the United States westward to a line which would cross Nebraska and Kansas about half way between their eastern and western borders. The subhumid region lies between the humid and arid regions, extending from the Gulf of Mexico to Canada and including irregular areas in the different Pacific coast States; while the arid region includes all the territory lying west of the eastern subhumid belt with a considerable exception along the Pacific coast, and with smaller local areas in each of the arid States.

Irrigation is employed as an aid to agriculture in all of these regions. It is a necessity in the arid region, of great value in the subhumid district, and is proving highly profitable in the growing of certain crops in the humid region. There are also large areas in the recently acquired insular possessions of the United States where irrigation is required, and where the value of the products permits of a large outlay to provide for its use. The work of the irrigation investigation of the Office of Experiment Stations covers therefore the whole of the United States.

Investigations in the Arid Region.

The greater part of the irrigation work of this Office has been carried on in the region where farming is impossible without the artificial application of water to crops. This includes all of the Territories of Arizona and New Mexico, the States of Colorado, Utah, Nevada, Montana, and Wyoming, and large parts of California, Oregon, Washington, Idaho, North Dakota, South Dakota, Nebraska, Kansas, and Texas. The greater attention paid to the problems of this section of the country is justified by the fact that here irrigation is a necessity rather than a valuable adjunct to agriculture. It measures agricultural settlement and very largely controls the development of other industries, because both the cost and comfort of living are very largely determined by the production of a home food supply. In the regions farther east, the adoption of irrigation is determined by whether or not it will improve conditions already favorable, but in the arid region it is the choice between civilization and desert condition.

The work in this region has followed two general lines—agricultural and engineering, legal and social. Of these, the legal and social problems present the greatest difficulties and stand most in need of an early solution. The success of irrigated agriculture in this region requires first of all the creation of institutions which shall offer a just and adequate foundation for future development. Such a foundation requires that the users' rights to streams must be clearly defined in order that those who now use streams and those who expect to use them may understand how much of the water supply is appropriated and how much remains open to appropriation. The litigation and controversy which now menace communities and which are a constant source of anxiety and loss to irrigators should be brought to an end. In order to effect these desirable reforms, a knowledge of certain essential facts is required. Among these are the quantity of water required to grow crops, the losses from seepage and evaporation in distribution, the character of the control over streams already vested, and the kind of administrative measures needed to insure effective division of streams among the

multitude of users who depend thereon. Specific information along these lines is indispensable to wise and effective action in the future either by the Government or by individuals. It is the information which should have been gathered at the very outset of this development, but the long delay in its collection renders it all the more urgent that it be carried on now to an early and effective completion.

The work along agricultural and engineering lines has been largely carried out in co-operation with the agricultural experiment stations of the different States, and with the State engineers in States having such officials. By undertaking systematic work on some of the general problems of irrigation, this Office has been able to supplement and extend the work of the experiment stations, and at the same time has aided them to take hold of other studies, such as problems relating to the economical use of water on different crops. It makes possible the bringing together of observations from the whole country. It promotes uniformity of methods in these investigations and thus gives to the results a wider value than is possible with each station working independently and alone. It brings together the experience of the whole irrigated West for the use of each locality, and shows the farmers of one section where their practices can be improved by adopting those of other and oftentimes far distant sections.

Agricultural and Engineering Problems.

The studies of the practical questions involved in diverting water from streams, transporting it through canals and ditches, distributing it over the land, and determining the requirements of different crops have been carried on in all the arid and semi-arid States with one exception. In general, the results of this work show that the losses in distribution are much greater than has usually been supposed, and that the quantity of water required, where these losses are included, is somewhat greater than has been estimated by many writers on the subject or stipulated in many water-right contracts. The stations for the measurement of the duty of water are scattered over nearly one-third of the United States. The averagess of the different measurements for the past two years show a surprisingly close agreement when this wide range of conditions is considered, as appears from the following summary:

	Feet.
The average depth of water applied to crops in 1899 was.....	4.35
The average depth of water applied to crops in 1900 was.....	4.13

One of the results of this work has been to show the importance of keeping canals in good conditions, and to emphasize the benefits resulting from diminishing as far as possible the losses by percolation. Measurements show that the loss from seepage and evaporation in ditches and canals varies from 15 to 70 per cent of all the water taken in at their heads, and that by far the greater part of this loss was due to seepage. Formerly, many believed that most of the loss was due to evaporation, and was, therefore, beyond the power of man to remedy. Now that it has been demonstrated that the water disappears through the sides and bottoms of ditches and canals, steps can be taken to improve these channels and the loss stopped to a great extent. Improvements of this character will increase the area which can be irrigated, and save much land for productive agriculture which would otherwise become swamps and marshes.

The difference between the high and low duties obtained under practically the same conditions shows that where water can be had in abundance the natural tendency is to use too much, resulting in a reduction in the yield of crops, a temporary injury to the land, and a limitation of the area which can be irrigated with the available water supply.

In many localities a lavish use of water has converted areas once arid into alkali marshes, of which the only product is cat-tail flags, and made drainage necessary at a cost fully as great as was required to provide the water supply in the first instance. The need of this drainage might have been avoided in many cases had canals been constructed with more care and the evil results of over-irrigation appreciated at the outset.

The soils of the arid region are rich in mineral ingredients. This is due in part to their origin and in part to the scanty rainfall, which has not been sufficient to wash out the soluble elements, as has been the case in humid regions. Because of this there are large areas which are highly charged with alkali. The tendency of irrigation is to leach these salts out of the higher grounds and concentrate them in the lower lands. Evaporation tends to bring them to the surface, where they accumulate in such quantities as to kill vegetation. The remedy is to be found in drainage, and this investigation has been called upon to assist in solving the larger engineering and legal problems connected with the formation of drainage plans. As some of these districts embrace in the aggregate many thousands of acres, in which not only the alkali but the water plane has risen until it has reached the surface, it is necessary that the plans should be comprehensive, and must include provision for removing the surplus water as well as the salts which are to pass with it. Drainage studies must include the causes of their being flooded and a determination of the source and volume of the water to be removed. Drainage and irrigation are a part of one whole, and their investigation should be carried on together. The office is now engaged in this work in Colorado and California.

The publication and circulation of the facts being gathered regarding the injuries resulting from excessive losses in distribution or wasteful use will go far to prevent a recurrence of such injuries in other localities where irrigation is yet in its infancy. Another result will be the reclamation of more land than would otherwise be possible.

Instruments for Measuring Water.

In carrying on the measurements of water it was found that the instruments used were in many cases not suited to the work required of them, and were so expensive as to limit their use generally to Government and State work. With the progress of the work of the investigation there has been a growing demand for instruments which will do accurate work and at the same time be within the reach of canal companies and individual irrigators. The instruments most used are the current meter and the register for keeping a continuous record of depth of water at any point. Efforts have been made to cheapen these instruments and at the same time increase their efficiency. Little has been accomplished with the current meter, but the water registered has been so simplified as to reduce its cost by more than half without any sacrifice in accuracy.

Legal and Social Problems.

The measurements made to determine the quantities of water used and the losses from canals has another object besides the improvement of agricultural practices. It is a principle of irrigation law, in theory at least, that rights to water are based on beneficial use; that is, a person or company can maintain a right to only so much water as he or it can put to a beneficial use in irrigation. It is of first importance, therefore, to know how much water is needed to grow crops on a given area, in order that courts and boards control may intelligently determine the amount of rights to water, and officers charged with this duty be able to prevent wasteful use by those who have early rights or a desire to monopolize the supply. Because of

the lack of this information, rights to water have too often been established without any regard to the volume of the stream, the capacity of canals, or the needs of the land to be irrigated. The attempt to utilize such excess rights can lead to nothing else than continued litigation and trouble. The facts gathered in these investigations are already being eagerly sought as a guide in the establishment of water titles, and they are certain to prove one of the most effective agencies in preventing erroneous or excess decrees in the future.

A knowledge of the extent of the losses from canals is also necessary to the proper distribution of the supply. Appropriations usually contemplate the measurement of the volume allowed at the head of the canal, hence the amount granted should be great enough to meet all the necessities of crops and also to allow for losses in transit. If this estimated loss is too large the volume taken in at the head gate will be greater than the needs of the land irrigated, but if too small irrigators will suffer. Excessive allowance for these losses puts a premium on poor construction, hence data is needed to show what are reasonable losses and to prevent anything above this. Where losses can be stopped appropriations should be cut down in order to compel ditch owners to make them economical water carriers. Losses which can not be stopped should be provided for.

Irrigation Laws.

Along with the observations and experiments in the use of water has gone a study of the laws and customs which control its distribution. This study reveals the fact that the development of irrigation law has not kept pace with irrigation engineering or agricultural practices. As the need and value of water has increased, engineers and farmers have found ways to conserve the supply and economize in its use. But it is too often the case that this increase in value has only added to the uncertainty as to titles, since it presents greater inducements or temptations to those holding inferior rights to try to secure a larger share of the supply. The absence of tribunals for the final establishment of water titles, and the lack of public control over the division of streams, puts upon the holders of the older and better rights the burden of protecting their interests either by force or in the courts. The greatest need of irrigation is legislation which will end this uncertainty and controversy, but from the nature of things such legislation is hard to secure. Conservative legislative bodies are slow to act, and they often have not the information on which to base intelligent action, even if they have the desire to do all that should be done. The conflicting views of appropriators of water make it impossible to enact any effective law which will not be strongly opposed, or which will not work hardship to some individual. The work of this Office is limited to collecting and publishing information, with discussions by experts whose broad views enable them to better interpret the facts than is possible where details and local interests obscure the general policies which should prevail.

Studies of irrigation laws and customs have been made in connection with the measurements of water in all the arid States and Territories. Comprehensive studies of irrigation laws and customs have been made in California and Utah. A report dealing with the agricultural situation in California has just been published. This study was undertaken in response to a petition from the citizens of that State in the hope that a clear statement of existing conditions would help toward the enactment of a comprehensive code of irrigation laws.

A similar study has been made in Utah, and the reports of the different observers are about ready for publication. These reports will show that titles to water in that State are far from being stable or secure, and that there

is urgent need of a cheaper and simpler method by which they can be permanently settled.

The conditions found in California and Utah are not peculiar to those States. They are common to nearly all the arid States. Their betterment is the first step in the successful or the complete use of Western water supplies. As has been said, the work of this Office can not extend to the enactment of laws. It must stop with showing existing conditions and pointing out remedies for the evils found. With this end in view the laws of not only our own States, but of Canada, Australia, Europe and Egypt, are being studied in order that the best lessons from the experience of all the world may be within the reach of those who must enact the laws which will protect and encourage investment in irrigation enterprises. An agent of the Department is now in Egypt studying the legal systems in vogue there.

Organization of Irrigation Industries.

Not less important than the system of irrigation laws is the character of the organizations which control the water supply under these laws. Irrigation is essentially a co-operative industry. In its beginning small ditches were sometimes constructed by individual farmers, but opportunities for such construction are practically all utilized. The large canal covering the lands of many farmers is in most remaining cases the only possible one; hence the existence of the industry calls for organization and co-operation, and in most cases not only co-operation of farmers but of capitalists as well. The problem to be solved here is how to secure returns upon the capital invested and at the same time keep the land and water within the reach of the poor man, the only man who is seeking for a new home. This problem has not been solved in this country. It is one which must be solved before irrigation can go much further.

Under the laws of many States water rights are granted to the canal companies. In those States the rights of the farmers depend on the form of the organization of these companies, rather than on the laws. The reports of this Office show that the peace and prosperity of many communities, as well as the economy with which water is used, depend almost wholly on the rights of the individuals under the companies. This study of organization and its effect on development is being carried on wherever the measurements of water have been made.

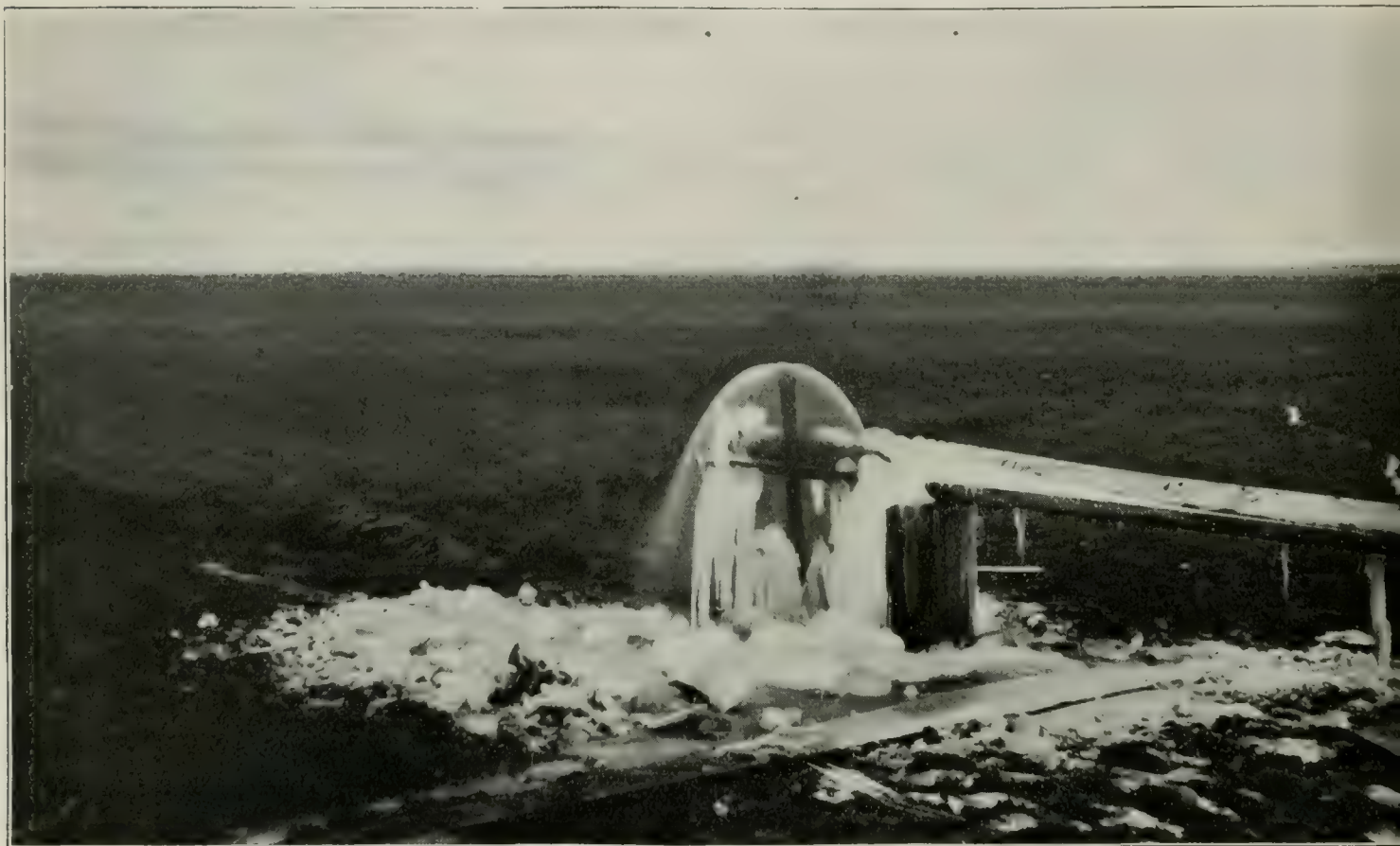
In this connection it seems proper to reiterate the views expressed in a former report on the subject of water rights. The first step in future development should be to reach an enlightened agreement regarding the true character of these rights. The idea of private ownership in water apart from land can not prevail without creating institutions essentially feudal in character. To give to companies or individuals the control of streams, and make the farmers who use those streams dependent for their rights on the conditions which these companies impose in private contracts, is to make the water company the practical owner of the land it serves and the irrigator and farmer a tenant. A proposition which would contemplate turning over all the land of the West to private monopolies and making those who have homes upon it dependent upon these monopolies would not command popular support, but the idea of private ownership in water, amounting to a virtual monopoly of this vital element, has been permitted to grow up in some sections of the West. To a certain extent it has obtained recognition in legislation and protection in judicial decrees and decisions. Such a doctrine meets with no favor in other irrigated lands, and should in this country give place to the more just conception that rights to water should be restricted to the right of use, and that ownership should not be vested in either companies or individuals, but in the land itself. When this principle is adopted

the control of water is divided like the control of land among a multitude of proprietors; water monopoly is impossible, and no other abuse or injustice is encouraged. Years of experience in other lands and the limited experience of this country have abundantly proven that peaceful and orderly development can not be realized except as water and land are united in one ownership, and canals treated as public or semi-public utilities rather than as a means of fastening a vicious monopoly upon communities.

IRRIGATION STATISTICS.

(From Report of the Twelfth Census.)

The necessity for irrigation in Montana is not so imperative as in Wyoming and Colorado. The table-lands and cultivable areas of the state gener-



ONE OF SEVEN FLOWING IRRIGATION WELLS ON BURTON BENCH, TETON COUNTY.

ally are of low elevation, as the slope of the Great Plains which constitute a large part of the State, is toward the north. By reason of its diversified physical character, comprising lofty and detached mountain ranges, broad valleys and vast table-lands, the State for the most part receives a larger precipitation than other arid States.

The period between 1870 and 1900 has witnessed a remarkable change in agricultural values. The census of 1870 reported live stock on farms in Montana valued at \$1,818,693, and the value of all farm lands, including buildings and implements, as valued at \$729,193, or about 40 per cent of that live stock. In that year no report was secured of the value of live stock on the range or public domain. If account were taken of this fact it would be seen that in 1870 the value of live stock in Montana was at least three times that of all farm land and buildings. In the thirty years succeeding, the live stock interests gained enormously and in 1900 had a gold value of nearly forty times that in 1870, but the number and value of farms have increased so much

more rapidly that in 1900 they were worth \$62,026,090, while the live stock had a value of \$52,161,833, or 15.9 per cent less. In 1870 farming was but an incident to live-stock raising, while in 1900 the conditions were reversed and the keeping of animals was less important than other agricultural operations. This tremendous increase is largely due to the successful application of irrigation in the cultivation of hay and forage, cereals, fruits, and vegetables.

Table A shows by counties the changes between 1889 and 1899 in the number of irrigators and the acreage irrigated.

TABLE A.—NUMBER OF IRRIGATORS AND ACRES IRRIGATED, 1889 AND 1899, WITH PERCENTAGES OF INCREASE.

COUNTIES	NUMBER OF IRRIGATORS			ACRES IRRIGATED		
	1889	1899	Per Cent of Increase	1889	1899	Per Cent of Increase
The State (a)	8,043	3,706	117.0	951,154	350,582	171.3
Beaverhead	457	294	55.4	138,022	42,606	223.9
Broadwater (b)	190	.....	.....	30,144	.....	.....
Carbon (c)	716	.....	.....	51,287	.....	.....
Cascade (d).....	218	73	(e) 198.6	27,593	4,411	(e) 525.5
Choteau (f)	397	39	1,366.7	49,086	2,834	2,718.3
Teton (g).....	175	.....	.....	30,784	.....	.....
Custer	233	60	288.3	18,659	4,302	333.7
Dawson (h)	20	12	483.3	999	194	5,506.7
Valley (i)	50	.....	.....	9,878	.....	.....
Deer Lodge (j)	495	470	(e) 5.3	78,118	50,948	(e) 53.3
Fergus	452	251	80.1	71,152	30,401	134.0
Flathead (k)	116	.....	.....	6,074	.....	.....
Missoula (l)	364	504	154.8	15,500	22,404	296.5
Ravalli (m)	804	.....	.....	67,249	.....	.....
Gallatin	659	434	51.8	60,267	46,901	28.5
Granite (n)	168	.....	.....	18,513	.....	.....
Jefferson (o)	206	184	(e) 13.0	16,149	15,105	(e) 6.9
Lewis and Clarke (p)	370	231	(e) 60.9	30,663	15,441	(e) 98.6
Madison	593	345	71.9	74,980	36,819	103.6
Meagher (q)	173	260	(e) (r) 33.5	43,213	39,324	(e) 9.9
Park (s)	415	330	(e) 25.8	29,917	19,735	(e) 51.6
Silver Bow	161	75	114.7	10,049	5,968	68.4
Sweet Grass (t)	326	.....	.....	37,494	.....	.....
Yellowstone (u)	285	144	97.9	35,364	13,189	168.1

(a) Exclusive of Indian reservations.

(b) Organized from parts of Jefferson and Meagher counties in 1897.

(c) Organized from parts of Park and Yellowstone counties in 1895.

(d) Part of Meagher county annexed since 1890.

(e) Comparison with figures of 1889 insufficient, as important changes in county lines have been made.

(f) Part taken to form Teton county in 1893.

(g) Organized from part of Choteau county in 1893.

(h) Part taken from Valley county in 1893.

(i) Organized from part of Dawson County in 1893.

(j) Part taken from Granite county in 1893, and part annexed to Flathead and Lewis and Clarke counties since 1890.

(k) Organized from part of Missoula in 1893; part of Deer Lodge county subsequently annexed.

(l) Parts taken to form Flathead and Ravalli counties in 1893.

(m) Organized from part of Missoula county in 1893.

(n) Organized from part of Deer Lodge county in 1893.

(o) Part taken to form Broadwater county in 1897.

(p) Parts of Deer Lodge and Meagher counties annexed since 1890.

(q) Parts taken to form part of Sweet Grass county in 1895, and part of Broadwater county in 1897; parts annexed to Cascade and to Lewis and Clarke counties since 1890.

(r) Decrease.

- (r) Parts taken to form parts of Carbon and Sweet Grass counties since 1890.
- (s) Organized from parts of Meagher, Park and Yellowstone counties in 1895.
- (t) Parts taken to form parts of Carbon and Sweet Grass counties since 1890.

The number of farms outside of Indian reservations increased in ten years 132.9 per cent, the number of irrigators, 117.0 per cent, and the irrigated area, 171.3 per cent.

Table B gives certain statistics of irrigation in 1900 by counties, exclusive of Indian reservations.

TABLE B.—NUMBER OF IRRIGATED FARMS COMPARED WITH TOTAL NUMBER OF FARMS, AND IRRIGATED ACREAGE COMPARED WITH TOTAL IMPROVED ACREAGE, JUNE 1, 1900.

COUNTIES	NUMBER OF FARMS			NUMBER OF ACRES IN FARMS		
	Total	Irri-gated	Per Cent Irrigated	Improved	Irri-gated (b)	Per Cent Improved Land Irr-gated
The State (a)	13,047	8,043	61.6	1,697,424	951,154	56.0
Beaverhead	518	457	88.2	168,451	138,022	81.9
Broadwater	222	190	85.6	49,484	30,144	60.9
Carbon	871	716	82.2	77,165	51,287	66.5
Cascade	1,144	218	19.1	118,911	27,593	23.2
Choteau	762	397	52.1	90,242	49,086	54.4
Custer	804	233	29.0	90,359	18,659	20.6
Dawson	259	20	7.7	19,645	999	5.1
Deer Lodge	564	495	87.8	92,489	78,118	84.5
Fergus	732	452	61.7	121,389	71,152	58.6
Flathead	767	116	15.1	64,109	6,074	9.5
Gallatin	950	659	69.4	172,287	60,267	35.0
Granite	205	168	82.0	26,272	18,513	70.5
Jefferson	235	206	87.7	23,176	16,149	69.7
Lewis and Clarke	531	370	69.7	63,682	30,663	48.2
Madison	674	593	88.0	111,836	74,980	67.0
Meagher	198	173	87.4	52,419	43,213	82.4
Missoula	615	364	59.2	47,982	15,500	32.3
Park	532	415	78.0	44,566	29,917	67.1
Ravalli	891	804	90.2	81,012	67,249	83.0
Silver Bow	215	161	74.9	13,383	10,049	75.1
Sweet Grass	402	326	81.1	39,495	37,494	94.9
Teton	347	175	50.4	49,768	30,784	61.9
Valley	226	50	22.1	21,278	9,878	46.4
Yellowstone	383	285	74.4	58,024	35,364	60.9

(a) Exclusive of Indian reservations.
(b) Irrigated in crop year of 1899.

Of the 13,047 farms in the State, excluding those in the Indian reservations, 8,043 are irrigated, and 5,004 are unirrigated. The acres in the irrigated farms number 5,822,995, in the unirrigated, 2,468,091. The value of all land in the irrigated farms, not including buildings, is \$36,057,373, and of the unirrigated, \$9,156,667. The value of all buildings on irrigated farms is \$6,948,616, and for the unirrigated, \$2,241,354. Live stock on the irrigated farms has a value of \$32,318,267, and on unirrigated, \$19,710,791. The irrigated farms are 61.6 per cent of the total number, and the corresponding percentage of acreage is 70.2; that of the value of land and improvements, exclusive of buildings, 79.7; buildings, 75.6; implements and machinery, 71.2; live stock, 62.1; and that of the total of all these forms of farm wealth is 67.9.

The average size of all farms, exclusive of the holdings of Indians, is 635 acres. The average size of irrigated farms is 724 acres, and the average amount of irrigated land on each irrigated farm is 118 acres. On the

farms making use of irrigation, the average value of products not fed to live stock is \$5.55 per acre. In the counties outside of Indian reservations the average value per acre of land, exclusive of buildings, is, for all farms, \$5.45, for unirrigated farms, \$3.71, and for irrigated farms, \$6.19. The average value of irrigated land per acre is \$19.66; while that of the best irrigated land, suitable for the growing of alfalfa, is from \$25 to \$100; irrigated fruit land is even more valuable.

Cost and Extent of Irrigating Systems.

The following table gives, by counties, the principal statistics relating to the cost and extent of the irrigating systems of the State.

TABLE C.—NUMBER, COST OF CONSTRUCTION, AND LENGTH OF MAIN CANALS AND DITCHES, AND ACREAGE IRRIGATED IN 1899.

COUNTIES	NUMBER, COST OF CONSTRUCTION AND LENGTH OF DITCHES			NUMBER OF ACRES		Average Area Irrigated Per Mile of Ditch
	Number	Cost of Construction	Length in Miles	Under Ditches	Irrigated	
The State (a)	2,902	\$4,683,073	6,812	1,818,600	951,154	140
Beaverhead	403	289,100	600	150,450	138,022	230
Broadwater	108	141,300	235	33,100	30,144	128
Carbon	171	230,000	457	90,000	51,287	112
Cascade	59	179,520	225	228,610	27,593	123
Choteau	105	180,595	276	114,000	49,086	173
Custer	111	259,535	163	37,144	18,659	114
Dawson	7	8,050	6	1,270	999	166
Deer Lodge	156	303,000	300	85,000	78,118	260
Fergus	175	159,000	512	100,000	71,152	139
Flathead	33	55,350	65	7,250	6,074	93
Gallatin	114	446,369	458	89,800	60,267	132
Granite	57	109,000	140	30,000	18,513	132
Jefferson	74	64,736	118	32,000	16,149	137
Lewis and Clarke	127	133,500	250	120,000	30,663	123
Madison	200	393,880	680	130,000	74,980	110
Meagher	95	114,800	240	50,000	43,213	180
Missoula	96	87,029	130	21,000	15,500	119
Park	208	188,446	496	49,305	29,917	60
Ravalli	277	574,498	395	106,155	67,249	170
Silver Bow	37	43,500	108	12,500	10,049	93
Sweet Grass	174	221,865	349	71,815	37,494	107
Teton	43	153,050	234	166,221	30,784	132
Valley	21	80,000	197	32,000	9,878	50
Yellowstone	51	266,900	178	60,980	35,364	199

(a) Exclusive of Indian reservations.

The total amount invested in ditches in Montana to June 1, 1900, is approximately \$4,683,073. The total value of irrigation products in 1899 was \$7,230,042. No reports were received concerning the cost of irrigation ditches in the Indian reservations. The number of acres of land irrigated for each mile of ditch reported is 140, as compared with 124 in Arizona. The number of acres under ditch for each miles is 267. In Arizona it is 591. The average cost of construction per mile is \$687.47 and \$4.92 per acre for land actually irrigated in 1899. In Arizona the average cost of constructing the ditches per mile was \$2,954, and \$24 per acre for the land actually irrigated in the above year. This large difference in the cost of construction of irrigation systems is explained by the fact that the majority of the ditches in Montana are of private ownership and without expensive dams and head-gates. Most of the investments in irrigation ditches have been highly profit-

able and but few disappointments have followed the efforts of irrigators to reclaim the arid lands.

While it is known that Montana possesses considerable quantities of ground water, or so-called underflow, but few attempts have been made to utilize it for irrigation. The ample supply furnished by the streams and the comparatively inexpensive systems required to divert it upon the land, account for the fact that there were no reports of farms irrigating from wells.

Value of Land and Cost of Water.

The following table shows by counties the average values of farm land with and without irrigation and the cost of water.

TABLE D.—AVERAGE VALUE PER ACRE OF IRRIGATED AND UNIRRIGATED FARMS AND IRRIGATED LAND, JUNE 1, 1900, WITH AVERAGE COST PER ACRE OF WATER RIGHT AND MAINTENANCE.

COUNTIES	AVERAGE VALUE PER ACRE, EXCLUSIVE OF BUILDINGS				AVERAGE COST FOR WATER PER ACRE	
	All Farms	Unirrigated Farms	Irrigated Farms	Irrigated Land	Water Right	Annual Maintenance
The State (a) ..	\$5.45	\$3.71	\$6.19	\$19.66	\$3.12	\$0.28
Beaverhead	7.48	3.38	7.69	13.24	2.01	0.20
Broadwater	8.94	5.43	9.27	16.74	4.49	0.16
Carbon	10.06	3.20	11.38	19.69	3.61	0.26
Cascade	4.83	4.09	5.87	15.04	1.41	0.31
Choteau ..	4.30	2.25	5.47	13.88	1.87	0.27
Custer	2.98	2.32	4.35	29.47	9.13	0.79
Dawson	2.20	2.04	3.06	12.19	7.19	0.39
Deer Lodge ..	7.04	4.79	7.19	20.48	3.85	0.23
Fergus	4.58	2.16	4.91	12.70	1.60	0.21
Flathead	11.02	11.58	8.20	32.46	7.70	0.52
Gallatin	12.50	10.74	13.04	31.22	5.88	0.13
Granite	9.40	5.20	9.75	14.99	5.84	0.27
Jefferson	9.74	2.59	10.16	22.31	3.91	0.14
Lewis and Clarke ..	5.43	5.26	5.48	14.00	1.30	0.20
Madison	7.95	6.18	8.09	17.70	4.48	0.23
Meagher	2.78	1.25	2.82	12.49	2.61	0.14
Missoula	11.26	8.46	12.73	55.91	7.80	0.33
Park	5.45	4.73	5.54	15.73	3.57	0.33
Ravalli	16.26	6.44	17.17	37.46	5.92	0.12
Silver Bow	9.09	5.54	9.58	23.77	4.32	0.17
Sweet Grass	3.68	2.32	3.84	21.31	3.32	0.68
Teton	4.88	4.22	5.33	14.82	1.03	0.32
Valley	3.68	3.52	3.91	18.47	2.80	0.15
Yellowstone	1.91	1.37	2.34	32.15	5.52	0.49

(a) Exclusive of Indian reservations.

Irrigated Crops.

The relation of irrigation to the various agricultural operations can be noted in the following table which shows the total and irrigated acreage and production or crops.

TABLE E.—TOTAL AND IRRIGATED ACREAGE AND PRODUCTION OF CROPS IN 1899, WITH PERCENTAGES.

CROPS	ACREAGE			PRODUCTION			
	Total	Irrigated	Per Cent Irrigated	Unit of Measure	Total	Irrigated	Per Cent Irrigated
All crops	1,151,674	755,865	65.6	.. .. .	.. .. .	.. .. .	.. .. .
Corn	3,301	929	28.1	Bushels ..	75,838	24,895	32.9
Wheat	92,132	37,710	40.9	Bushels ..	1,899,683	843,143	44.4
Oats	133,938	90,514	67.6	Bushels ..	4,746,231	3,367,671	71.0
Barley	22,848	18,666	81.7	Bushels ..	844,140	726,617	86.1
Rye	2,003	852	42.5	Bushels ..	33,120	16,210	48.9
Wild, salt, or prairie grasses.....	567,587	342,793	60.4	Tons	545,841	350,640	64.2
Millet and Hungarian grasses	3,690	3,419	92.7	Tons	4,705	4,396	93.4
Alfalfa or lucern	68,959	66,906	97.0	Tons	186,498	183,603	98.4
Clover	12,498	12,009	96.1	Tons	22,630	22,069	97.5
Other tame and cultivated grasses	180,178	142,635	79.2	Tons	237,950	195,654	82.2
Grains cut green for hay	40,374	21,255	52.6	Tons	57,837	32,985	57.0
Forage crops	2,426	1,783	73.5	Tons	**3,900	3,045	78.1
Dry beans	101	65	64.4	Bushels ..	1,110	717	64.6
Dry peas	1,512	1,053	69.6	Bushels ..	32,365	21,912	67.9
Potatoes	9,613	6,976	72.6	Bushels ..	1,332,062	1,022,337	76.7
Onions	151	118	78.1	Bushels ..	29,113	22,767	78.2
Miscellaneous vegetables	4,121	2,645	64.2	.. .. .	.. .. .	.. .. .	.. .. .
Small fruits	554	464	83.8	.. .. .	.. .. .	.. .. .	.. .. .
Orchard fruits	* 5,571	* 4,978	89.4	Bushels ..	45,192	42,796	94.7
Other crops	117	95	81.2	.. .. .	.. .. .	.. .. .	.. .. .

** Estimated from number of trees.
* Includes corn strippings.

The total number of acres of irrigated crops as given above is 755,865, while the total number of acres of land irrigated is 951,154, the difference 195,289 acres, represents approximately the area of pasture land irrigated. It is probable that a portion of the area upon which crops were reported as grown without irrigation was really irrigated at some time during the year.

Table F shows, by counties, the value of the irrigated crops in 1899.

TABLE F.—VALUE OF CROPS PRODUCED IN 1899 ON IRRIGATED LAND, BY COUNTIES.

COUNTIES	All Crops	Hay and Forage	Cereals	Vegetables	Orchard Fruits	Small Fruits	Other Crops
The State *	\$7,230,042	\$4,336,311	\$1,991,741	\$775,289	\$55,383	\$67,811	\$3,507
Beaverhead	617,067	481,015	119,623	16,425	4	.....	.....
Broadwater	262,949	142,276	88,582	27,001	3,545	1,495	50
Carbon	475,722	200,386	219,485	51,604	2,744	1,172	331
Cascade	204,003	129,826	23,568	47,077	1,510	1,982	40
Choteau	239,700	193,677	29,494	16,091	.....	238	200
Custer	144,508	127,255	8,291	8,772	75	115	.....
Dawson	12,137	5,686	3,356	3,043	.....	52	.....
Deer Lodge	602,598	415,420	105,652	78,054	77	3,395	.....
Fergus	467,097	319,190	120,176	25,995	.....	1,262	474
Flathead	67,156	30,786	11,653	24,267	189	261	.....
Gallatin	783,149	136,478	558,199	34,645	451	3,314	62
Granite	159,103	111,531	29,116	18,211	13	232	.....
Jefferson	155,801	122,204	9,310	23,085	134	1,068	.....
Lewis and Clarke	300,084	193,968	38,495	65,158	150	2,313	.....
Madison	569,561	348,758	132,869	76,602	2,706	8,626	.....
Meagher	226,263	189,036	22,697	14,208	21	251	.....
Missoula	216,239	104,001	32,943	43,701	21,706	13,888	.....
Park	265,011	167,363	68,035	26,437	307	2,509	330
Ravalli	643,056	271,006	231,537	96,042	20,992	23,479	.....
Silver Bow	77,937	62,670	3,334	11,876	1	56	.....
Sweet Grass	256,276	194,870	43,199	18,110	.....	97	.....
Teton	100,209	71,204	21,843	7,162	.....	.....	.....
Valley	36,334	29,839	920	5,575	.....	.....	.....
Yellowstone	348,082	237,816	69,364	36,148	758	2,006	1,960

* Exclusive of Indian reservations.

Drainage Basins.

The main range of the Rocky Mountains crosses the northern boundary about ninety miles east of its northwest corner, and in the form of a bow, with the center of the arch at Butte, extends southeasterly and then southwesterly to the junction with the Bitter Root range, forming the boundary between Montana and Idaho as far as the National Park on the east. The extremely rugged character of the western portion gave to the State its name—Montana—"mountainous." More than two-thirds of the State is on the eastern slope of the Rockies and consists of table-lands, the greater part of which is comprised in the drainage basins of the Missouri and Yellowstone rivers. As the Yellowstone is a tributary of the Missouri, the Missouri River basin practically includes two-thirds of the State. This basin has a total area at the head waters of 95,093 square miles, of which 13,315, or 14 per cent, are within the Dominion of Canada, leaving 81,778 acres, all in the State of Montana, with the exception of a few square miles in the Yellowstone National Park. In the southwestern part of the State the basin attains its highest elevation and the slope is gradual toward the north and east.

Three important streams, having their sources in the mountains, unite at different points in the State to form the Missouri river—the Jefferson, Madison, and Gallatin rivers.

The Jefferson river, formed by the union of the Big Hole and Beaverhead rivers, flows in a general northeasterly direction for about sixty miles. This drainage basin comprises a large area of irrigable lands, which, owing to the low elevation and the favorable position, are very highly cultivable. Many of its smaller branches flow through broad, open, and fertile valleys,

excellently adapted to agriculture. The valley of the main stream is from 40 to 50 miles long and several miles in width. The drainage basin of this river includes all of Beaverhead, the southern part of Silver Bow, the western part of Madison, and the southern part of Jefferson counties.

The Madison river rises in the National Park, flows westerly and northwesterly for about thirty miles through canyons, and then turns to the north and enters Madison Valley, which is some thirty to thirty-five miles long, by eight to ten miles wide in the center, gradually narrowing at both ends. The elevation of the valley is about 5,000 feet and agriculture is practiced therein to a marked degree.

The Gallatin river has its sources in the northwestern portion of the Yellowstone National Park and vicinity, and flows in a general northerly course through a succession of narrow valleys and canyons for a distance of about fifty miles from its head waters, until it finally enters the Gallatin Valley, one of the finest agricultural areas of Montana or any of the Western states. Its flow is augmented by that of the East Gallatin, which enters the valley at the lower end, draining the short range of mountains of the same name. The soil is very fertile, the climate temperate, and the farms in the valleys are among the most highly cultivated in the West.

Among the lesser affluents of the Missouri are the Teton, Marias, Judith, Musselshell, Sun, and Milk rivers.

The Yellowstone river rises in the National Park to which it has given its name and flows northward through wonderful canyons and over two noted precipices into the State of Montana. At Lewistown it turns abruptly eastward and flows in a generally easterly and northeasterly direction to a junction with the Missouri at Fort Buford, in North Dakota, near the eastern boundary of Montana.

The area of the Yellowstone Basin in Montana is approximately 36,312 miles and its general outline is triangular, the main stream forming the long side of the northern boundary of the basin. Almost the entire water supply comes from the streams heading in the Absaroka and Big Horn ranges in the southern part of the basin, Wyoming furnishing the greater part of it. These ranges, having an altitude of 10,000 feet or more, are snow clad and furnish a large and perennial supply of water. The Yellowstone, where it joins the Missouri, carries nearly the same volume as the latter.

The Absaroka, Snowy, Big Horn, and Wind River ranges, in their great extent, elevation, and heavy precipitation, are important features of this basin when irrigation is considered. The streams which drain their timbered slopes receive a late summer supply in the form of melting snows which is available when most needed for irrigation.

On the mountain slopes, as a rule, are heavy forests, some of marketable value and much suitable for fuel. The timber area is estimated to be 11,320 square miles, firewood, 13,580 square miles, the remainder, 44,783 square miles, affording excellent grazing, only a small portion of it being cultivated.

The northeastern portion of the basin is an extension of the Great Plains in which the streams have cut deep channels. On the eastern edge, the erosion is very marked and the region is known as the Bad Lands, the country being similar to that in the vicinity of the Black Hills, wholly unfit for anything except grazing, and worth but little for this purpose.

AGRICULTURE.

Constituting as it does the first of the three general divisions in the title and work of this Bureau, it has been the aim of the Commissioner to make this part of the report more nearly representative than has been possible in former years; to include matter that will be of benefit to the farmers of our own State as well as giving some idea to others of the wonderful agricultural resources of Montana and the conditions under which the crops are raised and marketed.

From the many lessons which these necessary investigations have taught, two seem to stand out more prominently than the others, though perhaps all are of equal importance. The first is that in no instance is the product of any single line of agriculture equal to the demand for home consumption; and the second, the advisability of smaller farms with closer cultivation and diversity of crops. Justified in anticipating a rapid growth in population during the coming years, there is also justification in urging the advantages of the soil, climate and markets of Montana before all the world.

Broadly speaking, irrigation is an absolute necessity. It is true that there are specially favored localities where crops can be grown without water, notably in Flathead and parts of Cascade counties. Wonderful yields of wheat, oats and all vegetables, as well as magnificent fruits, are grown throughout the Flathead valley, the settlers relying upon their observations of weather conditions in determining whether winter or spring wheat is to be sown. Both are grown to perfection. Vast crops of grain are also harvested from the bench lands in Cascade county without the use of water and, in the opinion of Mr. Elwood Mead, who is at the head of investigations of irrigation matters in the United States Department of Agriculture, there are still thousands of acres in those two districts where it is possible to duplicate the successes already of record. It is upon the artificial use of water, however, that the great agricultural development of Montana must depend. It is well, therefore, for intending settlers, and even for our own people, that they realize before it is too late, the mighty possibilities afforded by the national irrigation law.

Probably a conservative estimate would place the average value of all arable land in Montana at the present time at \$2.50 per acre, and it is equally conservative, according to officers of the United States Department of Agriculture who base their judgment upon the experience of Colorado and California, to place the value of the same land, after water has been put upon it, at from \$50 to \$70 an acre; and furthermore, that this change will have taken place in great part, at least, during the next ten years. The states both east and west of us are fast settling up. The "homeseekers" who have



BRIDGE ACROSS YELLOWSTONE RIVER AT GLENDIVE. 1610 FEET LONG, INCLUDING APPROACHES.
THE LARGEST BRIDGE IN MONTANA, COST \$80,000

heretofore been carried by, or who stopped short of Montana, must soon be landed here. The natural advantages of our matchless state will appeal to the new comers, and the consequent increase in the demand for land will cause it to advance in price. The population of every city, town and village as well as that on the ranches, even if doubled, would give us a total of less than half a milion people. With this increase we could reasonably hope to see the water power of the state developed and utilized in hundreds of mills and factories. We would witness the fruition resultant upon the plants for reclaiming vast tracts of arid land with government aid; the already immense mining operations enlarged and extended and Montana, indeed, glorifying her title as the Treasure State.

Intensive Farming.

The system of farming now in vogue upon the great majority of Montana farm lands is not what it should be. The enormous yields of cultivated crops only intensifies the lessons of "what might be." Influenced, perhaps, by the imensity of their environment, farmers have chosen to be known as successful through their holdings of land rather than upon its productivity with the result that while the average farm has grown from 164 acres in 1890 to 886 acres in 1900, production has not kept pace with the increase of holdings. The really great farms are those that show the largest gross income. Compared with similar areas in the East where, without doubt, better methods prevail, the actual product of Montana farms is much lower, but compared with similar localities in our own state where intensive methods have been adopted, the production is insignificant. The following figures will show the basis upon which these conclusions are predicated, the figures being taken from the bulletins of the Twelfth Census:

The average gross incomes per acre for the various groups classified by area, are as follows:

Farms under 3 acres.....	\$3,721 38
3 to 9 acres	46 23
10 to 19 acres	18 44
20 to 49 acres	15 04
50 to 99 acres	14 99
100 to 174 acres	4 08
175 to 259 acres	7 39
260 to 499 acres	3 54
500 to 999 acres	2 88
1,000 acres and over	1 13

What better argument in favor of a change to smaller farms and closer cultivation can be advanced than is contained in these figures? Even admitting that the large results shown in the three acre holdings are due in a great measure to the fact that in these are included the big cattle companies who only use a matter of three acres for their buildings, etc., and range their stock on the public domain, the difference in the production of the 10 to 19 acre tracts and that of the 100 to 174 acre holdings, which includes every 160 acre farm in the state, is the difference between \$18.44 for the former and \$4.08 for the latter, or over 450 per cent. The best authorities agree that

a small tract of land under high cultivation is more remunerative than a large tract that is improperly worked.

Lulled by plenteous returns for a minimum of labor, many of our farmers have fallen into slipshod methods. Even the high prices and unsupplied condition of our home markets do not appeal to them as they should. A man who has an earnest interest in the economic welfare of the people of Montana is required to restrain himself in his characterization when he contemplates any analyses the condition whereby so many thousands of dollars are sent out of the state each year for articles that should be raised at home. The money so expended never returns. It represents the difference between prosperity and hard times. It retards the natural growth and advancement of our great commonwealth. It can be saved to our people by the abandonment of present wasteful methods and the substitution of rational, enlightened, intensive cultivation of the soil. Our farmers and the best methods are too far apart.

The movement for the establishment of Farmers' Institutes through state aid is a step in the right direction. It should be extended and developed until there is a live, energetic organization in every county in the state. Another progressive step that would lead to good results would be the establishment of a system of home experiments where the neighboring farmers would engage to conduct a series of experiments with different crops in such a manner that the different stages of growth, management and results would be open to inspection by all the residents of the locality, and the lessons so inculcated would be demonstrated by actual observation. A practical farmer could learn more through this method than by years of bulletins and lectures. Such a system is actively carried on in Canada and is reported as the most satisfactory method yet undertaken. This work might very properly be done under the supervision of the Agricultural College. The results would form the basis for the programs of the County Farmers' Institutes and a vast amount of information would inure to the farmers by personal investigation. Instead of showing fanciful results of crops nourished and fostered by an appropriation, these experiments would show what could be done under conditions as they actually exist on the farms under the supervision of the farmer himself—something that no report or bulletin can do. Nothing can be more certain than that the agricultural future of Montana will depend upon the small farm with intensive methods and diversified products and every effort should be put forth to hasten that end as well as to afford the farmers every opportunity to perfect themselves upon up-to-date methods.

Phenomenal yields in various crops are so common as to excite only passing interest and no effort has been made to record them. Mention is here made of a few authentic cases, not in spirit of boastfulness but to substantiate with facts the wonderful fertility of the soil and to emphasize what may be done by careful cultivation and the judicious use of water. From one year's seeding 15 acres in Beaverhead county yielded 60 tons of timothy hay. In Yellowstone county a measured acre yielded 150 bushels and six pounds oats. In Flathead county a field of nine and five-eighth acres of

wheat measured out from the machine 724 bushels or a little over 76 bushels to the acre. Another record is that of 1,213 bushels of potatoes from one acre grown near Park City. So far as known these have never been exceeded and wil probably stand as records for some years to come.

One of the unique features of agriculture in Montana is the Montana Co-Operative Ranch Company which owns 8.440 acres of land in the famous Sweet Grass Hills, near Shelby. The company has 12,000 to 15,000 head of sheep and is also raising hogs and Angora goats. The plan upon which the ranch is operated allows the stockholders in the company to place sheep, cattle or other stock upon the land with no expense whatever for their care. The land and improvements belong to the company. The dividends from the general business are divided among the stockholders as well as one-half the increase and profits divided from the flocks or herds they individually own. The enterprise has so far been very successful and will declare a 10 per cent dividend on January 1, 1903. About 20 men are employed.

The following table will give an idea of the productive capacity of the soil of Montana as compared with the other states of the Union:

AVERAGE PRODUCTION AND VALUE OF CEREALS FOR THE YEAR 1901.

NAME OF PRODUCT	Acreage	Produc- tion Bushels	Value	Av. Yield Per Acre Bushels	General Average for U. S.
Corn	3,095	77,375	\$69,638 00	(a) 25.0	16.7
Wheat	88,807	2,353,386	1,576 769 00	(b) 26.5	15.0
Oats	147,365	6,189,330	2,228,159 00	(c) 42.0	25.8
Barley	16,398	639,522	364,528 00	(d) 39.0	25.6
Rye	1,834	48,968	29,381 00	(e) 26.7	15.3
Total	257,499	9,308,581	\$4,268,475 00		

(a) 18 States produced more corn to the acre than Montana; Iowa and Montana each produced 25 bushels.
(b) Montana outranked all states except Washington which produced 29.1 bushels to the acre.
(c) Montana surpassed all other states in the production of oats per acre except Nevada and Washington, which states yielded 43 and 47.5 bushels per acre respectively.
(d) Idaho yielded 40.2 and Washington 43.5 bushels per acre.
(e) Montana ranks first in average bushels per acre, the next highest being Wyoming.

ON THE FARM.

The returns to this office of the yields of cereals, vegetables and fruit from farms in all sections of the State almost challenge belief. From every point comes the report of harvests that excite wonder in the mind of the reader. With natural conditions of sterility and drouth overcome by judicious irrigation, the Montana farmer is able, year after year, to make his land produce bounteous and profitable crops, and to eliminate in great measure the possibilities of failure. Painstaking, intelligent mastery of progressive methods, coupled with consistently applied labor, insure a measure of success that is not excelled in any country on earth. To the Eastern farmer, discouraged with complete and successive failures, obliged to content himself with meager crops that scarcely pay for harvesting, some of the statements in this article may suggest the "boomer." It is merely the

intention of the Bureau, however, to impress upon the minds of all the unsurpassable opportunities which agricultural Montana offers. Astounding as is the yearly output of our mines, it will yet be exceeded by our agricultural wealth. Fertile valleys and bench lands will soon be converted into productive areas by the magic influence of water, and in vast districts which now are barren and desolate will appear the small irrigated farm, yielding fabulous crops and affording thousands of people happy and comfortable homes. There is no class of people on earth to-day so prosperous and contented as the thrifty Montana farmer. There is room for thousands more. Money is necessary. You cannot get improved farms with perpetual water rights for nothing. It takes cash and labor to bring water to wild land, and without them the settler will meet with many discouragements. Come prepared to make an investment. In no other locality are you so certain to gather a rich reward. It does not require a fortune to get located, but it is better and safer to come with money enough to buy a water right. It is this that carries the value. There are some portions of the State where irrigation is not necessary, but in these localities there is little if any land that can be homesteaded, and there is the same uncertainty of crops that attends all places that depend upon natural precipitation. The safe way is, either buy land with a water right or get land where you can combine with your neighbors in a co-operative canal. Either of these will put you in a position where you can participate in the good times that crops, such as are detailed in the tables below, will bring.

The tables exhibit tests made at the Agricultural Experiment Station at Bozeman.

Table Showing Yields per acre of Spring Wheat, With Two Irrigations During the Season, the Period of Growth Being From 116 to 133 Days:

Name of Variety	Pounds. Straw.	Bush. Grain.	Name of Variety	Pounds. Straw.	Bush. Grain.
Onyx	4,650	74.5	Chili	4,260	56.0
Opal	4,440	73.0	Ladoga	3,570	53.5
Amethyst	6,870	67.5	Glyndous 676	4,980	49.0
Bordeau N. M. 472	7,680	64.0	Glyndous 661	5,460	49.0
Black-Bearded Centennial..	5,040	64.0	Imp. Russian R 6 P 1.....	5,460	49.0
Gneiss	4,710	63.5	Glyndous 692	5,100	48.0
Nose B	5,400	59.0	Hungarian Mountain	3,180	48.0
Gypsum	5,490	58.0			

Table Showing the Yields per acre of Oats During the Season, with Two Irrigations, the Period of Growth Being From 117 to 124 Days.

Name of Variety	Pounds. Straw.	Bush. Grain.	Name of Variety	Pounds. Straw.	Bush. Grain.
Russian 2788	4,740	107.6	White Danish	3,450	83.8
Canadian White	5,190	92.6	Siberian (15)	3,480	82.9
White Swede	3,300	91.7	Black Tartarian	3,780	82.9
American Beauty	3,780	86.4	Victoria	3,660	79.4
Archangel	4,050	85.5	Poland White	3,000	79.4
Great Northern	4,470	85.5	Giant Yellow	3,570	78.5
Nameless Beauty	3,360	84.7	Nebraska		77.6
Giant Yellow	4,080	84.7			

Table Showing the Yields per acre of the Best of 67 Varieties of Potatoes, With Two Irrigations, the Period of Growth Being From May 25, When Planted, to October 6 and 7, When Harvested.

Name of Variety.	Market-		Name of Variety.	Market-	
	Total	able		Total	able
	Bush.	Per ct.		Bush.	Per ct.
Montana Beauty	699.3	80.4	Charles Downing ..	768.5	74.8
Rural New Yorker No. 2...	698.4	90.8	New Queen	758.8	77.0
Beauty of Hebron	961.8	70.2	Unknown	739.5	90.6
Winters White	860.3	79.7	Jennie ..	729.8	70.8
White Elephant	821.6	63.5	Lee Favorite	729.8	93.0
Rural Blush	821.6	98.4	Early Telephone	705.6	77.6
Irish Daisy	792.6	78.6	Crown Jewel	696.0	45.1
White Star	773.3	68.7			

Table Showing the Yields per acre of the Best 15 of 25 Barleys, in Growth 101 to 119 Days, with Two Irrigations.

Name of Variety	Pounds.		Name of Variety	Pounds.	
	Straw.	Grain.		Straw.	Grain.
Goldenthorpe	3 036	68.1	Smooth Hulless	3,090	55.6
Black Hulless	2,580	62.5	New White Hulless	2,940	55.0
Highland Scotch	3,930	60.6	Winnipeg	2,940	53.7
Guy Male	2,610	60.6	Imp. Cheyenne	4,110	53.1
Manshury	4,500	58.7	King 9-10	3,270	57.8
New Zealand	3,660	58.7	Manhattan	4,770	50.6
Manshury	3,150	56.8	Chevalier	3,420	48.7
Italian	3,360	56.2			

Results of the season's work upon the grain lands that are watered by the canal of the West Gallatin Irrigation Company, add their quota of testimony to support statements concerning the wonderful fertility of Montana soil. This company has a canal 112 miles long, which furnishes water for 4,183 acres of land, and the reports show that no less than 225,762 bushels of grain, valued at \$110,762.56 were harvested from this tract. The crops were divided between barley, oats, wheat and flax.

There were 1,517 acres of barley which averaged 59 bushels to the acre, or 90,087 bushels, valued at \$43,441.76; 982 acres of oats yielded 73 bushels to the acre, weighed 40 pounds to the bushel, making a total of 71,874 bushels, valued at \$28,749.60; 1,654 acres of wheat which averaged 37 2-3 bushels an acre, or a total of 63,202 bushels, valued at \$37,921.20; and 30 acres of flax, yielding 20 bushels an acre with a value of \$650.00.

On the bench lands of Beaverhead county on what only a few years ago was called "The Dry Ranch," the result from 1,100 acres was 61,341 bushels of grain of 42 lbs. each. The yield per acre varied from 40 to 85 bushels, the average being 56 bushels throughout. Oats were worth at the time one cent a pound and the total value of the crop was \$25,763.22, while the bill for threshing amounted to \$920.10.

At a ranch near Bozeman 360 acres yielded 20,398 bushels of grain, an average of nearly 57 bushels an acre; 180 acres of meadow cut 600 tons of hay; an 8-acre field of timothy cut 62 tons. In the same vicinity 50 bushels of barley, the finest grain in the world, was the average yield, while from 75 to 100 bushels of oats was not uncommon; and these results repeat themselves year after year.

In Yellowstone, Fergus, Cascade, Flathead, Missoula, Ravalli, Lewis and Clarke and other counties of the State the same stories of abundant and profitable returns are told, but it is useless to repeat the figures. It is a record that cannot be duplicated anywhere else.

By comparing these figures with the average yields of states like the Dakotas, Michigan, and others, their true significance is shown. The aver-

age of wheat in Michigan has been as low as eight bushels an acre, and in North and South Dakota together down to seven and three-eighths bushels. On some of the Montana non-irrigated lands wheat, in bad years, has fallen as low as 12 bushels an acre, but good years brought the average up again. Prices are also better here and the market for farm produce of all kinds is of the very best.

More attention might well be paid to the cultivation of root crops by our farmers. Nothing excels in productivity or in value, as feed for stock, this class of farm produce. Sugar beets, mangle wurtzels, turnips and potatoes grow to enormous size, and without apparent limit as to number.



A FLATHEAD COUNTY WHEAT FIELD—NON-IRRIGATED.

Squashes and pumpkins attain dimensions that must be seen to be appreciated. Apples, peaches, pears, plums and cherries are grown to perfection in many parts of the State, Missoula, Ravalli, Yellowstone and Flathead counties leading. In 1901 over 175,000 50-pound boxes of apples were marketed, and in 1902 it is estimated that 300,000 boxes will be marketed, with many young orchards still to come in. Hundreds of thousands of packages of fruit are still shipped into the State, and it will be many years until the home supply will equal the demand. Prices for apples range from 75 cents to \$2.50 for a 50-pound box. Other fruit in proportion. Berries are easily grown, and show a richness and perfection that is admirable. Some foothill ranchers market strawberries as late as October 1st. The market for small fruits is unlimited.

The following shows the results of potato culture at the Agricultural College:

White Maine (late), 341 bushels to the acre.

Acme (early), 225 bushels to the acre. Quality and flavor good; dark color, no waste.

Early Ohio (pink), 286 bushels to the acre. Quality extra good.

Six Weeks Market (early), 248 bushels to the acre.

Early Ohio (red), 144 bushels to the acre. Both the red and pink early Ohio were sold under the same name by different seed houses, but are quite different potatoes.

Rural New Yorker No. 2 (medium early), 173 bushels to the acre. Extra good quality, white; mealy; no waste.

Early Oxford, 276 bushels to the acre. Excellent quality, white, no waste.

Lee's Favorite (medium), 293 bushels to the acre. Quality the very best; white; no waste.

Early Vaughn, 232 bushels to the acre. Poor flavor; white; mealy; no waste.

Snow Drop, 240 bushels to the acre. Soggy; poor flavor; yellow; no waste.

American Wonder, 260 bushels to the acre. Quality good; mealy; yellow; no waste.

Oregon Pearl, 270 bushels to the acre. Quality good; mealy; yellow; no waste.

In the above experiments where nothing is said about quality they have not as yet been tested for these points. In the other cases the test for quality was made by Miss Harkins, who tried them in the domestic science department and reported her observations. Lee's Favorite seems by these tests to be one of the best potatoes for this locality under ordinary conditions, both for quantity and quality.

Attention is called to the fact that it was impossible to give these crops sufficient water at a critical time.

Returns are at hand of many fields of potatoes that produced from 400 to 600 bushels, and one where no less than 1,300 bushels were dug from one acre of ground. Onions are also very prolific, and command a high price, generally averaging about one and one-half cents a pound. The nights are too cool for corn and very little is raised, and that principally in gardens for table use.

Many splendid fortunes have been made in market gardening.

NON-IRRIGATED FARMS.

The greatest success in farming without irrigation is realized in Flathead county. A study of the weather bureau tables for the past 20 years will show that while the precipitation varies greatly in the same months of different years, there is no great difference in the yearly rainfall. In other words, if the rain or snow does not come at one time of the year it does at another. By close observance of conditions, and by taking advantage of all natural seepages, farmers in this county are enabled to so manage their crops that an absolute failure is unknown. The farmers have become so accustomed to accomodate their crops to the precipitation that in their

wheat raising the kind of wheat sown—winter or spring—depends entirely upon the season of greatest snow or rain fall. In preparing the fields, double the number of acres is made ready for winter wheat that it is contemplated to sow. Half of this land is put into winter wheat. If, during the winter, there is a heavy snow fall, it is good for this crop, and there is almost absolute certainty that the following spring and summer will be dry and therefore, spring wheat will not do well. If, on the contrary, the snow fall is light, the other half of the land is ready for spring wheat early in the season with a good chance in favor of plenty of moisture. The land already sown to winter wheat can be utilized for other crops. It is said that this plan has never met with anything but unqualified success.

In Cascade county there are great tracts of land without water where phenomenal success has followed in the wake of hard work coupled with intelligence. The story of the attainment of wealth and happy homes by those who had the courage and ambition to apply their labor and energies to the soil, although in many instances these were their only possessions, reads like a romance.

In a recent article the "Great Falls Tribune" published letters from a large number of successful non-irrigating farmers showing conclusively that, in these instances at least, water was not necessary for the production of wonderfully prolific crops.

Among the many who wrote those of Cuno Jaeckel, C. F. Stork, Phillip Boucelet and Joseph Melah are reproduced as being only fair samples, and the story they tell of enormous yields of various crops will test the credulity of Eastern farmers. They are, however, all citizens of the strictest probity and their statements are quite susceptible of verification.

Never Had a Crop Failure.

Stockett, Mont., Nov. 6, 1901.

Farmed in Minnesota several years with little success. Came to Montana seven years ago. Located on 160 acres of land 25 miles south of Great Falls six years ago. Consider Cascade the banner county for farming. Never had a failure of crops and don't practice irrigation; in fact, no farmer in this section irrigates crops. Climate all right. This fall I harvested 640 bushels of wheat off 18 acres; 1,960 bushels of oats off 32 acres; 84 sacks of potatoes off of one acre. Seeded 15 acres to timothy last spring. Have 61 head of cattle, six horses and other farm stock and poultry. Am going into the cattle business on a larger scale. Yours truly,

PHILLIP BOUCELET.

No Complaint to Make.

Stockett, Mont., Nov. 12, 1901.

Came from Germany to Great Falls in 1892, and in 1893 located on a homestead—160 acres—on Upper Sand Coulee, 25 miles from Great Falls. Have never had a failure in crops and use no water for irrigation. Off 20 acres had 700 bushels of wheat; 2,600 bushels of oats off 50 acres; 100 sacks of potatoes off one acre; 40 tons of timothy off 20 acres. Farmers in this section are prosperous. Have no complaint about the climate. Yours truly,

JOSEPH MELAH.

Twelve Years of Farming.

Fairview Ranch, Cascade Co., Mont., Oct. 30, 1901.

In regard to crops grown on my farm in Cascade county, Montana, I

will say that the various yields since I commenced farming in 1892 are as follows:

WHEAT.

Year.	Bus. per Acre.
1892	50
1893.....	25
1894	12
1895	26
1896.....	27½
1897.....	12
1898.....	26
1899	26½
1900	10
1901.....	38

or an average for the 10 years of 25.3 bushels.

The crop of 1901 winter wheat went nearly 50 bushels to the acre, and the spring wheat went until 32 to 38 bushels, making an average of about 38 bushels. Oats this year have produced from 65 to 75 bushels to the acre; winter rye, 30 1-2 bushels; potatoes and vegetables, all good. I have raised at various times as high as 60 to 80 bushels of barley to the acre and upwards of 100 bushels of oats have been produced on my ranch. My acreage this year to small crops was some 60 acres, and produced:

	Bushels.
Wheat	11,000
Oats.....	7,200
Winter wheat	3,050
Barley	350
Total	21,600

I came to Montana and located on my farm empty handed 12 years ago. Have now some 2,000 acres of land, well improved and all fenced, considerable stock, farm well equipped with machinery and tools and estimate my holdings over and above all debts at \$35,000. In fact, I have recently been offered that amount for the property. The gross income from increase of stock this single crop year will exceed \$10,000. I feel perfectly contented on my Cascade county farm, and we do not wish to dispose of it, knowing I could never do as well in any other state. My family have at all times enjoyed good health here, and we think Montana is good enough for us.

Respectfully,

C. F. STORK.

Thirteen Years of Farming.

Great Falls, Cascade Co., Mont., Nov. 15, 1901.

I have been located on my present ranch, about 15 miles south of Great Falls, for 13 years. For several years I gave my particular attention to raising horses, but have gradually worked into farming, and am satisfied that good farming would be very profitable in many parts of this country.

I have had no complete crop failure in 13 years. Nineteen hundred was the driest year I have seen, when my wheat averaged 13 bushels per acre. This year (1901), 25 acres yielded 1,832 bushels of oats and 80 acres of wheat averaged 36 bushels; have 70 acres in timothy, which averaged two tons per acre. One of my neighbors has just threshed 1,320 bushels of wheat from 40 acres, or an average of about 33 bushels per acre. Very truly yours,

CUNO JAECKEL.

In Missoula county there are many who have had the same experience. In fact, this county, while justly claiming to be the garden spot of the State, and producing enormous crops of grain, fruit and vegetables, has a comparatively small area of irrigated lands. Numerous springs and the natural seepages afford moisture sufficient for the growing crops and in many instances fruitful farms are found high up on the sloping mountain side. It is much safer, however, to have a generous supply of water. Recent experiments in dry-country farming have demonstrated that much of the success depends upon thorough knowledge of the methods of cultivation and maintaining proper conditions of the soil after the crops are in, and it seems to have been demonstrated that crops can be successfully grown, if the right system is adopted, in any country that has an average rainfall of 18 inches.

in any country that has an average rainfall of 18 inches.

The theory involved is "moisture conservation," and the golden rule of the system is "never for a single minute during the entire year permit the surface of a field to give off water in evaporation." To secure these results the soil must be prepared for plowing by pulverizing the top, after which it must be plowed deeply. Then comes in the new thing; "sub-surface packing." Every forenoon just before dinner, and every afternoon just before supper, the plowman leaves his plow, and hitches his team to a machine called a "sub-surface packer," the unique function of which is to pack the lower part of the furrow slice, while the plowing is fresh and moist, leaving a few inches of loose soil on the surface. The tool consists of a large number of wheels turning on an axle, and having sharp edges for rims. These operations make the soil fine and firm, and strong in capillary attraction, so that water in large quantity may be held in every foot of soil and drawn up from beneath when needed. But it must be arrested at the surface, or the thirsty wind will suck it up and carry it off. Its arrest is accomplished by surface cultivation, keeping always on every field a dust mulch that will be evaporation proof, of three or four inches of loose surface soil.

This cultivation is shallow, but frequent; no more than from five to seven days must ever elapse in hot weather without a stirring of this mulch. Above all, no crust must be permitted to form upon the soil. Light harrowing of grain crops must be practiced for several weeks after planting, and constant attention must be given to the fields before, after and during the growing season, so that every drop of moisture may be trapped and held. There seems to be no reason to doubt that this method, thoroughly applied, will not only prevent fields from drying out but, except in sections which have less than 15 inches of precipitation annually, will actually establish an increasing store of moisture. The plan is to be given a thorough test on a government experimental farm.

ALFALFA.

Medicago Sativa.—The name of this great forage plant is derived from the Spanish "alfalfez." In France it is called "lucerne," in South America,

"Chilean clover," while in Arabia it is named "alfacfacah," which means "the best kind of fodder." In the great change that is now going on in the stock industry alfalfa is playing an important part. The change from the open range system, with no provision for winter feeding, has been gradually under way since 1886. It is bound to advance more rapidly in the near future, and will in time give way completely to a system of pasturing and feeding. To supply cheap and nutritious fodder will then be the problem for the stock man exactly as securing a good and sufficient range is to-day. There seems little reason to doubt that in the solution of this problem alfalfa will be the chief factor. *Bromus inermis*, or brome grass, which flourishes in a much dryer locality, and is successfully grown without irrigation, will furnish a part of the necessary feed and Kaffir corn will also be used, but by far the greater portion must come from alfalfa.

The success which has attended the cultivation of this plant in Montana, the enormous yield, its fattening qualities, its increased value when fed to stock, and many other considerations, all mark it as the ideal forage crop. Farmers should not be discouraged over the failure to obtain a "stand" of alfalfa on a certain field or in a particular season. There are times and places when it is difficult to get good results. A careful study and comparison of methods and conditions will invariably lead to success. Constant experiments are being made, and their success has established alfalfa as one of the great crops of Montana.

After the alfalfa has been sown in the spring it will be necessary to run a mowing machine over the ground two or three times during the summer to keep down the weeds. The sicklebar should be set high, so as to injure the small young plants as little as possible. If the vegetable debris is so abundant that it promises to smother the young alfalfa, it should be raked up and removed. In harvesting mow down as much of the crop at once as can be handled in one day. Let it wilt in the swaths and then rake it into windrows to cure. If the weather is fine, it can be stacked from the windrow by using a sweep rake and stacker. If the weather is threatening, bunch the windrows and cock the bunches to allow it to finish curing. It should be put into the stack with just as little handling as possible. To avoid molding it is advisable to store alternate layers of dry straw and fresh alfalfa hay together in the barn or stack. The straw need not form more than about one-fourth of the total weight. This method is especially applicable to the first crop in localities where old straw stacks can be easily acquired.

When possible, alfalfa should be stored under a roof, as it does not turn rain well. A cheap hay shed can be built by setting telegraph poles in the ground, braced by two-by-sixes, and putting a good shingle roof on the structure. The sides should be left open and the hay stacked under this shed in ricks. A stacker of some sort or other should be used, as it does not pay to handle the hay with a fork. They waste too much by shaking off the leaves, which are considerably better to feed than wheat bran, pound for pound. Where a roof cannot be had, the hay should be stacked in high, narrow ricks and covered with long slough grass. Alfalfa should be cured and stacked, if possible, without being rained upon. No other crop is so eas-

ily injured by rain. Alfalfa hay rained upon is worth about half what it would be were it unexposed.

Harvesting alfalfa at the right time and in the right manner very largely determines its feeding value. The majority of farmers wait too long before starting the mowing-machine. Alfalfa should be cut for hay when one-fourth to one-half of the blossoms have opened. When let stand longer, many of the leaves fall off and are wasted. Mowing early stimulates the growth of the following crop. Allowing it to go to seed seemingly exhausts the plant for that season.

Alfalfa fed green, either as a pasture or as a soiling crop, has few equals in its nutritive value. In localities where there is no difficulty in getting a stand, the cheapest way to feed it is probably to pasture it. It should never be pastured until the plants are more than a year old, nor at any time after a heavy dew or rain. Owing to their liability to hoven or bloat, it is always risky to pasture cattle or sheep upon alfalfa. Horses and hogs are not affected in this way. Before turning animals liable to bloat upon the alfalfa give them all they will eat of some other food. Death from bloat is often very sudden.

One acre of alfalfa will furnish forage for from 10 to 20 hogs per season. There is no cheaper or better way of producing pork than to allow growing pigs to run in a field of alfalfa. At a conservative estimate, 10 pigs per acre will gain 100 pounds each during the season from May to September, and 1,000 pounds of pork can not be produced so cheaply on any other feed. The pigs will come out of the field in autumn in capital condition to fatten with corn or small grain. The alfalfa in a hog pasture should be mowed once or twice during the summer, or whenever it begins to get hard and woody. This will provide plenty of young and tender herbage, which is more nutritious, weight for weight, than forage from the older plants, and if the swine are provided with this food in its most nutritious condition, their growth will be most rapid. They need to be provided with an abundance of fresh or running water in the pastures.

Alfalfa seed weighs 60 pounds to the bushel.

For a hay crop, sow 20 to 30 pounds of seed per acre.

For a crop of seed, sow 14 to 18 pounds per acre.

Sow clean seed.

North of the latitude of Washington, sow alfalfa in the spring, as soon as the ground is warm—from the middle of April to the middle of May. Sow in drills or broadcast.

In the South and Southwest and in California sow alfalfa in spring or autumn. Sow in drills. In the South sow in drills 16 to 20 inches apart, and cultivate the first season.

Do not cover the seed too deep.

Alfalfa does not attain maturity until the third or fourth year; therefore, do not sow expecting to get the best results in less than that time.

Alfalfa grows best on a deep, sandy loam, underlaid by a loose and permeable subsoil. It will not grow if there is an excess of water in the soil. The land must be well drained.

Alfalfa is a deep feeder. Plow the land thoroughly; the deeper the better.

Alfalfa thrives best in soils containing lime, potash, and magnesium. It does not grow well in soils containing an excess of iron, or where lime is wholly absent.

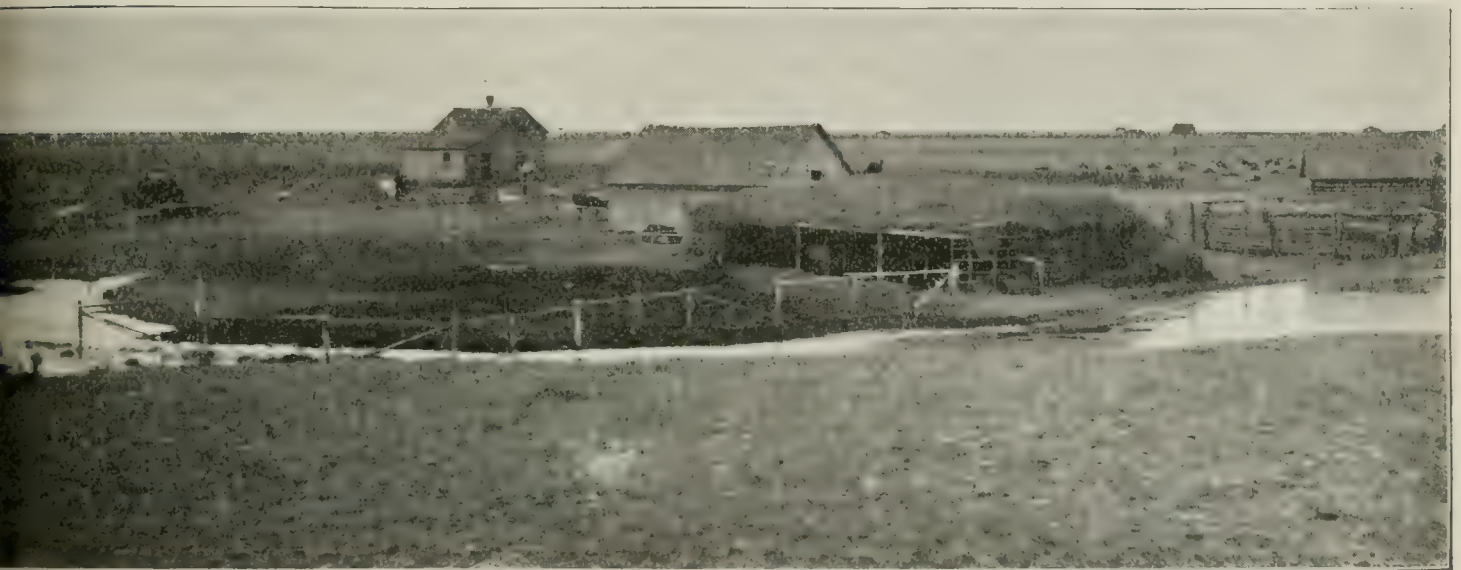
Cut for hay when the first flowers appear. If cut in full bloom, the hay will be woody and less nutritious.

Cut for seed when the middle clusters of seed pods are dark brown.

In the arid regions, where irrigation is practiced, put water on the field before sowing the seed, and immediately after cutting each crop of hay.

Horses can be pastured on alfalfa. There is no better hay for young, growing stock.

Do not plant alfalfa in the orchard. The roots go down deeper than



A RANCH ON BURTON BENCH, TETON COUNTY.

those of the fruit trees and the latter will make no growth, if, indeed, they are not killed.

Alfalfa hay is not a complete ration. The best results are obtained by feeding it in combination with a ration that contains starch, fats and fiber, such as corn fodder, wheat or oat straw, or roots.

To rid a field of alfalfa plow in mid-summer, turning up the roots to the hot sun. Or, if the field can be irrigated, let the water stand on it two or three days in mid-summer. This will rot the roots, and after the water has been drained off the field can be plowed.

Do not let water stand on the field for more than 48 hours. Alfalfa hay, properly cured has about the same value as red clover hay. The yield is much greater. It can be cut from three or four to seven or eight times a year, and yields from a ton to a ton and a half or more to the cutting.

Six to ten bushels of seed is the usual yield an acre.

Sow alone, without any nurse crops. The latter is often just as harmful as weeds. Screen alfalfa seed before sowing, to separate the weed seeds. Dodder or love vine is the worst enemy of alfalfa. Prevention is better than cure.

SUGAR BEETS.

Notwithstanding the remarkable results of the experiments in sugar beet culture, as shown by the subjoined table, nothing has been done in the way of establishing a beet sugar factory in Montana. Probably this is due more to legislation in Congress, supposed to be inimical to the beet sugar interests than to any other cause. From the interest that was aroused by the experiments on the Daly ranch at Hamilton, Senator Gibson's ranch in Cascade county, and in the Clark's Fork valley in Carbon county, it was hoped that some active steps would be taken in one or more of these localities to build a small factory at least.

The quality of Montana grown beets has been proven to be of the very best beyond all doubt. As it will require not less than 15,000 acres devoted to beet culture to supply one factory there would no doubt be some difficulty in securing the kind of labor that is required to handle such a crop. At present nothing is grown on large tracts in Montana that resembles the sugar beet. The market gardens near the large cities are nearest in comparison, and even the white labor for these is scarce. In many localities the Chinese have a monopoly in this line of business. To cultivate successfully the large area necessary to maintain a beet sugar plant cheap labor is required. In Michigan, which state has the greatest acreage of sugar beets, this class of labor is plentiful and had been trained upon the vast mint fields. With the very limited population in Montana it is very doubtful if this factor alone would not prevent the establishment of a beet sugar factory. There seems to be but one way in which this much-to-be-desired industry could be instituted, and that would be by colonization, as in Nebraska. Even this plan is open to much criticism, and it is doubtful if it will ever be tried. However, the field is growing for such an enterprise. We have the soil and climate to raise the finest sugar beets in the world, and it remains only for the capitalist to overcome the local difficulties, to reap a rich reward. The amount of money which it would be necessary to invest in a beet sugar plant makes the enterprise a slow one. Conservative estimates fix the sum at from \$300,000 to \$500,000, but at the average rate of consumption Montana spends about \$1,250,000 a year for sugar.

At the request of the Agricultural Experiment Station at Bozeman, farmers in many parts of the state last year cultivated sugar beets, sending the beets to the station for analysis. The results of the analysis have just been made public, and they show, beyond any question, that Montana is a great sugar-beet state and that Cascade county beets rank high in the list, the yield of sugar per acre in this county being greater than in any other except Gallatin.

The beets were of three varieties. The tests made in this country gave the following results:

Name.	Av. weight in ounces..	Per cent sugar in juice.....	Per cent sugar in beet.....	Purity Coefficient
Paris Gibson, Great Falls—				
Utah	44.00	13.5	12.82	65.00
Kleinwanzlebener	30.00	11.6	11.00	63.00
Vilmorin	48.00	15.4	14.63	70.00
C. H. Campbell, Great Falls.....	12.00	17.5	16.62	80.00
John H. C. Dale, Great Falls	33.00	17.00	16.15	86.28
Daniel Payne, Monarch—				
Utah	11.8	16.8	15.96	82.00
Kleinwanzlebener	9.66	19.2	18.24	80.3
Vilmorin	7.7	19.2	18.24	78.68

The following gives an average of the results in the several counties of the state in which tests were made:

Locality.	Beets per acre Tons.....	Per cent sugar in the beets..	Lbs. sugar per acre..
Bitter Root Stock Farm	16.5	19.64	6,771
Experiment Farm	10.9	16.98	3,690
Clark's Fork valley	18.00	16.97	6,174
Cascade county	25.00	15.40	8,075
Flathead county	12.8	17.95	4,520
Valley county	20.00	14.43	5,964
Park county	20.5	15.90	6,498
Fergus county	23.00	14.63	7,552
Carbon county	16.00	13.20	4,244
Missoula county	13.00	16.46	4,288
Gallatin county	31.00	14.68	9,332

Speaking of the tests, Dr. Traphagen, the chemist at the station, says:

"The results of sugar beet culture in Montana for the past season have been most gratifying, and we feel renewed confidence in the opinion expressed in Bulletin No. 19, that 'Montana conditions are favorable to the production of sugar beets of high sugar content and standard purity.'"

Sugar beets in the past have received very scant attention at the hands of those who have planted them in this State. Put in as an accommodation to the Experiment Station, they have been attended to after every other interest has been considered. When irrigated, if at all, they received water not when they most needed it, but when most convenient to the farmer. The same is true of cultivation, and this crop, which responds so readily to painstaking care, has been left to grow almost unattended. In spite of this, the results have been very pleasing. Montana seems to be the natural habitat of root crops, and the difficulty is to keep down the growth and prevent the formation of too large roots. Even at the Experiment Station, where the results have been such that the culture would always have been profitable, both from the standpoint of the producer and of the manufacturer, the sugar beets have been part of a rotation, in which they have been far from being the favored crop.

In the Clark's Fork Valley, near Bridger, Carbon County, a number

of the farmers experimented in the culture of sugar beets through the efforts of Mr. W. H. Bostic who secured the seed and distributed it among his neighbors. However, having had no experience in growing the beets, and failing to observe instructions regarding the handling of the samples sent for analysis, the showing was not so favorable as it would have been under more experienced handling. The samples were also sent to Prof. Traphagen, and gave returns as follows:

Raised by	Sugar in the Beets	Purity Co- efficient	Raised by	Sugar in the Beets	Purity Co- efficient
P. R. Miller	16.2	80	E. T. Bostic	20.8	88.3
C. F. Sexton	15.1	80.3	J. R. Stevens	14.1	77.4
A. E. Parker	13.6	69.4	S. H. Mendenhall	17.2	83.8
Wm. Barclay	15.4	73.2	Lucy H. Smith ..	19.1	83.7
Jas. Barclay	20.2	83	Thos. Burnett	15.7	80
C. M. Larkin	16	80	A. G. Duffield	16.9	83
W. H. Bostic	18.5	78.3	L. G. Prew	17	79.6
C. H. Bostic.....	14.7	67.1	F. O. Jennings	16.7	75
W. F. Gibson	17.1	74.4	B. F. Bayler	21.6	85.3
Hugh Morrow	18.7	74.5	Richard Barrows	17.7	82
R. B. Teasdale	17.9	85.4			

The results of the experiments at the Agricultural Station at Bozeman, Bridger and Gebo, Bitter Root Stock Farm and in Missoula, Gallatin, Cascade, Yellowstone, Park, Valley, Flathead, Custer, Dawson, Powell, Fergus, Carbon and Jefferson Counties, are given in Bulletin No. 33, issued at the Bozeman station. Bulletin No. 19 gives an explanation of the terms used, a general description of the beet and its cultivation, while Bulletin No. 27 gives the results of beet feeding to swine and other stock, as conducted by Prof. Shaw.

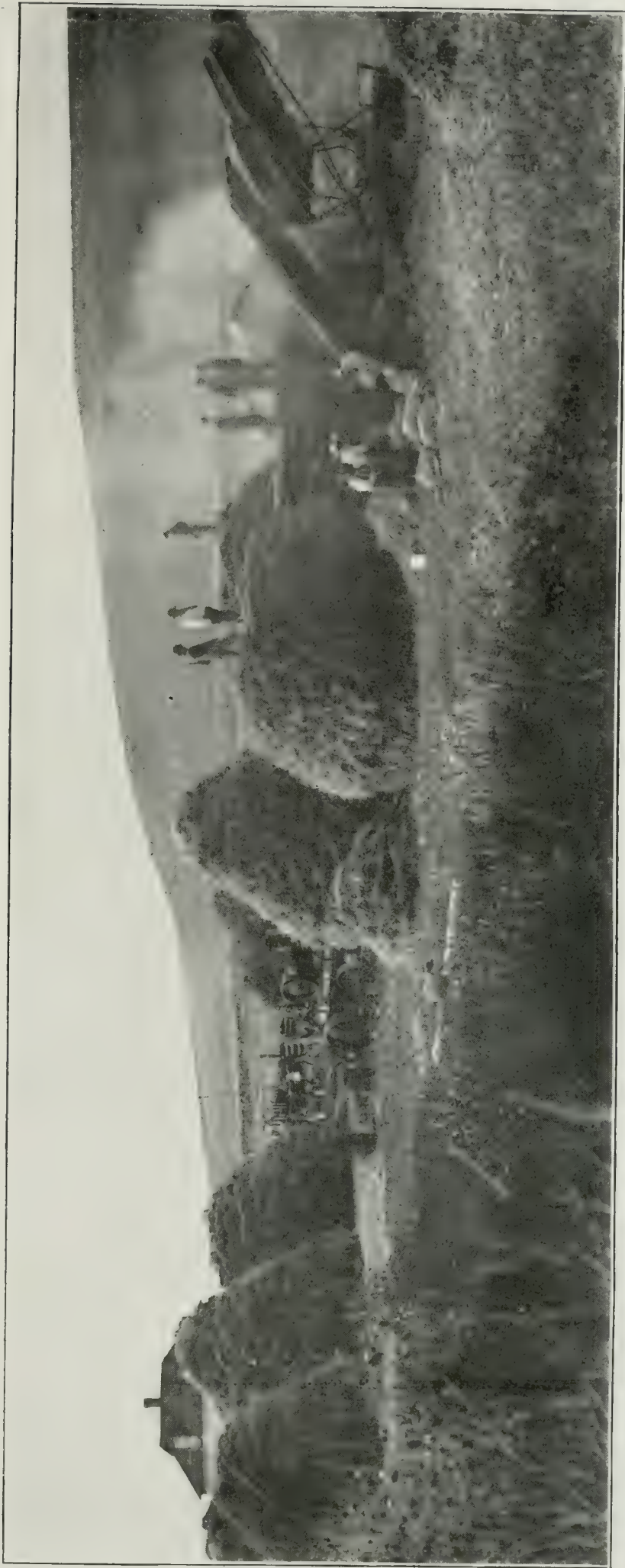
These experiments show clearly the value of the beets when combined with other feed for fattening purposes, and prove conclusively that beets are a valuable crop for stock feeding either before or after they pass through the sugar factory; and they also indicate that at some time in the future Montana will take its proper place among the great sugar producing states.

DAIRY PRODUCTS AND OLEOMARGARINE.

The recent legislation by Congress known as the "Oleomargarine Bill" which went into effect July 1, 1902, was made the subject of investigation by a commission appointed jointly by the Secretary of Agriculture and the Secretary of the Treasury, for the purpose of framing proper regulations for carrying out the provisions of the act. In these regulations, so framed, official definition is placed on the three products which the Oleomargarine bill recognizes. The first is butter, defined by the bill as a food product usually known as butter, which is made exclusively from milk or cream, or both, with or without common salt, and with or without additional coloring matter.

The second grade of butter known as "adulterated butter" is briefly described by the regulations as "re-worked or renovated butter to which a foreign substance has been added to deodorize or remove rancidity, or butter cheapened in cost by admixtures or made to contain abnormal quantities of water," etc.

The third grade, "process or renovated butter," is "a butter which has



AN INTIMATION OF THE REWARD OF A SEASON'S WORK ON THE NON-IRRIGATED BENCH LANDS OF CASCADE COUNTY

been subjected to the processes generally used for the renovation of butter, but without the introduction or use of any acid, alkali, chemical or any substance whatever, and without being made to contain abnormal quantities of water, milk or cream. Renovated butter having 16 per cent or more of moisture will be held to contain abnormal quantities of water, milk or cream, and be, therefore, classed as adulterated butter."

The regulations provide that every manufacturer of renovated butter shall place and keep on the side or end of his building in which the butter is made, a sign bearing distinctly the name of the manufacturer with the words, "Manufacturer of Renovated Butter, Factory No. —."

The regulations also allow the maker to divide the packages up into prints, bricks or rolls, but each must have stamped thereon the words "Renovated Butter." If these packages, too, are wrapped in cloth, or other material, they must also be properly marked. Manufacturers, however, are allowed to place upon the outside of their original packages, their names or some word or mark descriptive of the quality of the product, and they may do so, provided such brand does not obscure or cover up any of the stamps, marks or brands otherwise required for such packages.

The Department of Agriculture must affix stamps and see that the packages are properly marked in order that the contents may be identified. This requires considerable work at the factory, in transit, both interstate and foreign commerce, among the retailers, and even inspection among consumers. The Department of Agriculture will also make sanitary inspection of all renovated butter factories.

Special agents will be required to see that every package of renovated butter leaving the factory bears the stamp, while inspectors who are at the large cities inspecting butter packages intended for export, must see that all process butter sent out still retains the stamp showing its character.

Upon the "second grade" a tax of 10 cents a pound is levied, the same as upon colored oleomargarine, while upon the "third grade" is placed a tax of one-fourth of a cent a pound besides a nominal tax which every manufacturer of this grade is required to pay.

Of all the industries now lying dormant in Montana probably the one that offers the greatest possibilities of success is that of dairying. This business, which has been so highly developed, and is so great a source of wealth production in other states, has been almost wholly neglected in what is undoubtedly one of the most favorable locations in the United States for its successful prosecution. There is not half a dozen creameries in operation in the whole state and the capacity of these is very limited.

Two that were in successful operation in Missoula county have been recently destroyed by fire and were not rebuilt. As is the case in all communities where it is proposed to start a creamery, the chief difficulty is to get a sufficient number of milk cows to keep the plant up to its full capacity; but this will gradually be overcome as the farmers begin to realize that large profits are to be made from dairy cows and that the creamery relieves them from a vast amount of labor that is necessary under the old regime of home butter making.

With Montana grass lands, which are unexcelled on earth, at their present comparatively low values, and butter selling at 35 cents a pound, or more, there is no reason why the existing system of importing dairy products should be continued. This is another case, as in irrigation, where co-operation can be called into service. Let the farmers and business men in the different localities form a co-operative association, under the very favorable laws of the state, for the purpose of carrying on the business, and it will be but a short time until we will have the pleasure of publishing figures to show that instead of importing 45 per cent of the butter and practically 100 per cent of the cheese consumed in the state, we are producing not alone all that we consume, but are able to sell to other and less favored localities a Montana product that will have matchless qualities derived from the nutritious grasses, and superb climate of the Treasure State.

MONTANA AGRICULTURAL ASSOCIATION.

W. M. Wooldridge of Hinsdale, president of the Montana Agricultural Association, which was organized at a meeting held in Helena on the 15th of March, 1902, has announced the appointment of the several standing committees provided for by the by-laws of the association, as follows:

Irrigation—Prof. S. Fortier, Bozeman, Gallatin county; S. B. Robbins, Great Falls, Cascade County; W. B. Sands, Chinook, Choteau county; I. D. O'Donnell, Billings, Yellowstone county.

Forestry—Prof. E. N. Brandagee, Helena, Lewis and Clarke county; Prof. J. W. Blankinship, Bozeman, Gallatin county; C. W. H. Heederman, Missoula, Missoula county; Dr. F. W. Traphagen, Bozeman, Gallatin county; Prof. Morton J. Elrod, Missoula, Missoula county.

Exhibits and Publications—C. H. Edwards, 19 West Granite street, Butte, Silver Bow county; J. W. Pace, Helena, Lewis and Clarke county; E. N. Brandagee, Helena, Lewis and Clarke county; R. N. Sutherlin, White Sulphur Springs, Meagher county.

Horticulture—W. B. Harlan, Como, Ravalli county; T. A. McLain, Carlton, Ravalli county; C. W. H. Heederman, Missoula, Missoula county; C. H. Edwards, 19 West Granite street, Butte, Silver Bow county.

Highways, Telephones and Rural Free Delivery—I. D. O'Donnell, Billings, Yellowstone county; W. B. Sands, Chinook, Choteau county; W. W. Gamble Choteau, Teton county.

Farm Homes and Education—Prof. S. M. Emery, Manhattan, Gallatin county; Hon. Paris Gibson, Great Falls, Cascade county; R. N. Sutherlin, White Sulphur Springs, Meagher county; Mrs. Emma Ingalls, Kalispell, Flathead county; Mrs. S. M. Emery, Manhattan, Gallatin county.

Immigration—J. H. Edwards, Kalispell, Flathead county; W. M. Wooldridge, Hinsdale, Valley county; R. D. Steel, C. H. Campbell, Great Falls, Cascade county.

Dairying—Dr. W. P. Mills, Missoula, Missoula county; H. C. Burgess, Helena, Lewis and Clarke county; Captain Lloyd, Butte, Silver Bow county; W. A. Caldwell, Belgrade, Gallatin county; Mrs. W. C. Gelder, Chinook,

Choteau county; lady in the Bitter Root who took prize at the World's Fair.

Poultry—H. C. Gardner, Bozeman, Gallatin county; Mrs. H. C. Gelder, Chinook, Choteau county; others to be appointed.

Grains, Grasses and Forage Crops—Prof. R. S. Shaw, Bozeman, Gallatin county; P. B. Moss, Billings, Yellowstone county; I. D. O'Donnell, Billings Yellowstone county; Hon. A. S. Lohman, Chinook, Choteau county; Heiderman, Kalispell, Flathead county.

Cattle—J. B. Wellcome, "Herefords," Whitehall, Jefferson county; F. L. Benepe, "Herefords," Bozeman, Gallatin county; A. J. Davis, "Herefords," Butte, Silver Bow county; G. W. Springs, "Shorthorns," Bozeman, Gallatin county; Reuben Latimer, "Shorthorns," Missoula, Missoula county; C. X. Larrabee, "Shorthorns," Home Park, Granite county; W. A. Caldwell, "Red Polls," Belgrade, Gallatin county; E. L. Stone, "Red Polls," Absarokee, Carbon county; Hon. Paris Gibson, "Holsteins," Great Falls, Cascade county; Dr. W. P. Mills, "Jerseys," Missoula, Missoula county; H. C. Burgess, "Jerseys," Helena, Lewis and Clarke county; Hon. Jas. Donovan, "Guernseys," Helena, Lewis and Clarke county (ranch at Great Falls.)

Swine Breeders—J. F. Shreiner, Canton; W. B. Miller, Deer Lodge, Powell county; Dr. W. P. Mills, Missoula, Missoula county.

Horses—W. H. Raymond, Home Park, Granite county; C. W. Flemming, Clancy, Jefferson county; Thomas Cruse, Helena, Lewis and Clarke county; A. W. Paul, Great Falls, Cascade county.

Sheep Breeders—C. H. Campbell, Great Falls, Cascade county; H. H. Nelson, Riverdale, Cascade county; C. M. Jacobs, Chinook, Choteau county; P. B. Moss, Billings, Yellowstone county.

The vice-presidents of the Association are:

Beaverhead—S. R. Featherly, Dillon.

Broadwater—W. S. Thompson, Townsend.

Carbon—A. Elliss, Red Lodge.

Cascade—C. H. Campbell, Great Falls.

Choteau—R. H. Clarkson, Chinook.

Custer—J. W. Strevell, Miles City.

Dawson—E. H. Brewster, Wibaux.

Powell—C. H. Williams, Deer Lodge.

Fergus—G. C. Bower, Stanford.

Flathead—Fred Whiteside, Kalispell.

Gallatin—George B. Anderson, Bozeman.

Jefferson—T. T. Black, Whitehall.

Lewis and Clarke—H. L. Cram, Helena.

Madison—E. A. Maynard, Ennis.

Meagher—R. N. Sutherlin, White Sulphur Springs.

Missoula—J. R. Latimer, Missoula.

Park—Hon. John T. Smith, Livingston.

Ravalli—Hon. Aaron Conner, Darby.

Silver Bow—Andrew J. Davis, Butte.

Sweet Grass—E. O. Clark, Big Timber.

Teton—W. W. Gamble, Choteau.

Valley—D. C. Kenyon, Malta.

Yellowstone—W. O. Parker, Billings.

The principles and objects of the Association, as stated when it was organized, are:

"Recognizing the beauty and pleasure of life, and the important position of agriculture in the civilization of the world and the multiplication of the human family, it being the basis of the whole superstructural government since it is by the products of the earth's surface that animal life is sustained:

"Now, we, The Montana State Agricultural Association, do hereby declare, 'The making of two blades of grass to grow where but one grew before' to be the cardinal object of this organization.

"That we recognize the magnitude and possibilities of the agricultural resources of this great state and that our life's endeavor shall be the promotion of irrigation, of home building, and of the turning of Montana's broad prairies and primeval forests into happy homes for the industrial masses of our state and nation.

"That it shall be our endeavor to, in every possible way, increase the production of field, meadow, orchard and garden, and at the same time preserve the soil in its primitive riches for generations unborn; that it shall be our endeavor to promote the production and improvement of live stock of every description, including cattle, sheep, hogs and horses, the institutions of dairying and poultry growing, horticulture in all its branches, including floral culture, as well as the growing of standard apples and small trees; that it is our endeavor to convert every available quarter section of government land into a prosperous homestead.

"That, while we recognize gain as essential to human existence and a necessary precaution against want in old age, and commend a reasonable effort in the direction of a bank account that is not in red; that we regard the beautification of the landscape and the comforts and convenience of a home and the happiness and contentment of a good housewife and the children and the education of the children as paramount.

"That we urge the humblest and most remote dweller in the country homes of this mountain land to beautify them with flowers, stud them about with fruit trees and make them comfortable and cozy within, spare nothing within reason to make it earth's 'mecca' for every member of the family.

"That it shall be our endeavor by the promotion of laws, both state and national, to turn the wage-earners of our land into free-holders, home-builders and home-owners, thereby making room and profitable employment for untold thousands who prefer to remain in the ranks of labor; that we call upon our representatives in congress to use all honorable means in promotion of government irrigation as recommended by the National Irrigation Association, and every enterprise calculated to multiply the agricultural industry of the arid west; that we oppose all measures of whatever kind and description looking to the leasing of the government domain.

"And that we pledge every member of this Association, as he or she goes forth to his or her home, to mix and mingle as before with their fellow men, to take up the cause of husbandry anew, endeavor to promote better methods of farming, of the breeding of live stock and the better management of farms in reference to the soil preservation, and to in every way promote the pleasures of a home. That each and every member constitute a committee within himself or herself to labor for the principles herein set forth for the beautification of our land, the increase of production and the promotion of the brotherhood of man."

FARMERS' INSTITUTES.

The farmers institute movement in this country has now become national in its extent and, in the scope of its interests, has assumed international relations as connected with similar movements in other countries.

Having their origin in farmers societies of various kinds, some of which

date back half a century or more, the institutes have been developed through the efforts of farmers organizations, the agricultural colleges and experiment stations, boards and commissioners of agriculture, and many individual leaders in agricultural progress, until now they are held annually with more or less regularity in nearly all the states and territories. Beginning about thirty years ago the states have one after another shown their interest in this movement through their legislatures by appropriations to aid the institutes. Growth of interest in the institutes among the farmers has been reflected by a steady increase in the number of states thus providing for their maintenance and by the larger amounts of money devoted to this purpose from year to year. According to statistics published at the Office of Experiment Stations, in 1891, about \$80,000 was spent for farmers' institutes in the United States, and of this sum about \$60,000 was specifically appropriated for this purpose. In 1899 the specific appropriations for institutes aggregated a little more than \$140,000, more than twice the sum appropriated in 1891, and the estimated expenditure of funds derived from other sources was \$30,000, a grand total of more than \$170,000, spent for institutes that year. While the statistics collated by the Experiment Station's Office for the year 1899 were not complete, they showed that in that year over 2,000 farmers' institutes were held in the United States which were attended by over half a million farmers. The institutes were held in 43 states and territories. In 19 of these they were in charge of officers of agricultural colleges or experiment stations. In 17 they were under state or county officials, and in seven they were under the joint control of state officers and college or station officers.

Successfully conducted institutes are found under each system of management. Under different names meetings of farmers, in many respects similar to our farmers' institutes, are held in other countries. In some European countries in particular itinerant instruction for farmers is very thoroughly organized. While in some of our states the farmers' institutes are quite thoroughly organized, have liberal support and reach the farmers quite widely, in many of the states and territories the movement is yet in a comparatively weak condition and the organization and means for this work are inadequate.

Moreover, even in the states where the institutes are the most thoroughly organized and have had the greatest success, new problems relating to their management have arisen with the growth of the movement. For example there is an increasing difficulty in some states in securing workers thoroughly qualified for this kind of service who can attract large audiences of farmers and hold their attention throughout the meeting. It is a common experience that after the institutes have been held for a number of years in a given locality the farmers are not so ready to listen to local speakers or those who have nothing to give them except what has come within the range of their own limited personal experience. They demand that the institute workers shall have a wide range of knowledge regarding the science and practice of agriculture, and particularly up-to-date information regarding the progress that is being made throughout the world in

studying problems in agriculture both at the experiment stations and on the farms. This has led to a demand on the officers of our agricultural colleges and experiment stations for services at the farmers' institutes far beyond their ability to meet. There is, therefore, need of developing a class of institute workers who shall combine successful practical experience and scientific knowledge of agriculture with the ability to address a large audience of farmers in a way not only to hold their attention but also to impart to them definite information and instruction. Another problem of increasing importance relates to the ways and means of reaching the masses of our farmers through the institute. On the supposition that 500,000 farmers now annually attend the institutes, it will be seen that out of 10,000,000 farm workers in the United States only one in twenty is now reached by the institutes. These are, without doubt, in the main the most intelligent men in the business, and whatever good they receive from the institutes is disseminated to a considerable extent among their less aggressive and more careless associates. But the institutes should directly reach a far greater proportion of our farmers.

To do this various expedients will have to be adopted to adapt the institute to the needs of the different classes of our agricultural population. These examples of institute problems have been given to illustrate the fact that this movement has now reached such a stage of its development that the comparatively simple methods hitherto followed in the organization and maintenance of the institutes are not adequate for an enterprise of such magnitude as this has become. The solution of these problems will require much study, involving a comparison of methods employed in the different states and countries.

The publications of the United States Department of Agriculture and the experiment stations do not in themselves constitute all-sufficient methods and means for the dissemination of information on agricultural subjects among our people. While the work of the Department and the stations has already been so far disseminated and applied that it has made important changes for the better in our agriculture, the spread of the influence of these institutions is comparatively slow because the means for directly reaching the farmers are inadequate. The farmers' institutes may in a great measure supply this lack. When properly organized, they will bring to the masses of our farmers the information which they need to enable them to understand and apply the results of the work of the department and the stations, and will impress upon them by practical illustrations and demonstrations the benefits which advanced scientific knowledge may confer upon agriculture. Through the institutes, as in the case of other educational agencies, the living teacher coming in contact with the living worker, can produce results which it is hopeless to expect from printed documents however well written and illustrated.

CENSUS STATISTICS RELATING TO AGRICULTURE.

A "farm," as defined by the Twelfth Census, includes all the land, under one management, used for raising crops and pasturing live stock, with the

wood lots, swamps, meadows, etc., connected therewith. It includes also the house in which the farmer resides, and all other buildings used by him in connection with his farming operations.

The farms of Montana, June 1, 1900, numbered 13,370, and had a value of \$62,026,090. Of this amount, \$9,365,530, or 15.1 per cent, represents the value of buildings, and \$52,660,560, or 84.9 per cent, the value of land and improvements other than buildings. On the same date the value of farm



A FERGUS COUNTY RANCH.

implements and machinery was \$3,671,900, and of live stock, \$52,161,833. These values, added to that of farms, give \$117,859,823, the "total value of farm property."

The products derived from domestic animals, poultry, and bees, including animals sold or slaughtered on farms, are referred to as "animal products." The total value of all such products, together with the value of all crops, is termed "total value of farm products." This value for 1899 was \$28,616,957, of which amount \$17,924,442, or 62.6 per cent, represents

the value of animal products, and \$10,692,515, or 37.4 per cent, the value of crops, including forest products cut or produced on farms. The "total value of farm products" for 1899 was nearly five times as great as that for 1889 but a part of this gain is doubtless due to a more detailed enumeration in 1900 than in 1890. The most important item which was enumerated in 1900, but not in 1890, is the value of animals sold or slaughtered on farms, which for 1899 amounted to \$10,083,646, or nearly half the gain.

The "gross farm income," is obtained by deducting from the total value of farm products the value of the products fed to live stock on the farms of the producers. In 1899 the reported value of products fed was \$5,074,730, leaving \$23,542,227 as the gross farm income. The ratio which this amount bears to the "total value of farm property" is referred to as the "percentage of gross income upon investment." For Montana in 1899 it was 20.0 per cent.

As no reports of expenditures for taxes, interest, insurance, feed for stock and similar items have been obtained by any census, no statement of net farm income can be given.

Special reports as to the dimensions and cost of the leading irrigation ditches and canals, the area of land under them, methods for the artificial application of water to the growing crops, and other facts relating to irrigation, were obtained by correspondence with farmers, engineers, and others.

General Agricultural Statistics.

The total land area of Montana is 145,310 square miles, or 92,998,400 acres, of which 11,844,454 acres, or 12.7 per cent, are included in farms.

The state may be described as consisting of two divisions, Eastern and Western Montana, with the Rocky Mountains as the dividing line, the main range extending through the state from northwest to southwest, in the form of a bow.

Eastern Montana, which constitutes more than three-fifths of the total area of the state, is an extension of the "Great Plains," its surface being for the most part undulating, and broken at intervals by long, narrow valleys formed by the erosion of the rivers. The mean elevation of this part of the state above sea level is about 2,000 feet. In the extreme east lies a region known as the "Bad Lands," which is not only dry and unproductive, but practically nonirrigable, owing to the conformation of its surface. In the southwest are the valleys of the Gallatin, Jefferson, and Madison rivers, which contain large tracts of arable land, with a very productive soil.

The western part of the state is more rugged, the slope from the divide is abrupt, and the valleys, though numerous, are not extensive. Some very fertile lands are found in this region.

The agricultural lands are of three general classes—the bottom lands, lying near the streams, and possessing, as a rule, a rich, black, alluvial soil; the bench lands, whose soil is a sandy loam, capable of a wide range of cultivation; and the high bluff lands, which are suitable only for grazing purposes.

Number and Size of Farms.

The following table gives, by decades since 1870, the number of farms, the total and average acreage, and the per cent of farm land improved.

TABLE 1.—FARMS AND FARM ACREAGE: 1870 TO 1900.

YEAR.	Number of farms.	Number of Acres in Farms.				Per cent farm land improved.
		Total.	Im- proved.	Unim- proved.	Average	
1900	13,370	11,844,454	1,736,701	10,107,753	885.9	14.7
1890	5,603	1,964,197	915,517	1,048,680	350.6	46.6
1880	1,519	405,683	262,611	143,072	267.1	64.7
1870	851	139,537	84,674	54,863	164.0	60.7

The number of farms in 1900 was almost sixteen times as great as in 1870, and more than twice as great as in 1890, while the total acreage in farms is almost eighty-five times that reported in 1870 and six times that in 1890. The average size of farms, therefore, increased rapidly during each decade. There was a slight gain in the percentage of farm land improved between 1870 and 1880, but for the next two decades large decreases are shown. The increases in average area and the decreases in percentage of farm land improved are largely due to the addition to the farm area of large areas of grazing land formerly a part of the public domain.

Farm Property and Products.

Table 2 presents a summary of the principal statistics relating to farm property and products for each census year, beginning with 1870.

TABLE 2.—VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND OF FARM PRODUCTS: 1870 TO 1900.

YEAR.	Total value of farm prop- erty.....	Land im- provements, and build- ings.....	Implements and ma- chinery.....	Live Stock.	Farm Products*..
1900	\$117,859,823	\$62,026,090	\$3,671,900	\$52,161,833	\$28,616,957
1890	48,489,037	25,512,340	1,356,010	**21,620,687	6,273,415
1880	8,787,243	3,234,504	401,185	** 5,151,554	2,024,923
1870 (c)	2,693,324	729,193	145,438	1,818,693	***1,676,660

* For year preceding that designated.
** Exclusive of the value of live stock on ranges.
(c) Values for 1870 were reported in depreciated currency. To reduce to specie basis of other figures they must be diminished one-fifth.
*** Includes betterments and additions to livestock.

In the last ten years the total value of farm property has increased \$69,-370,786, or 143.1 per cent; that of farms, including improvements and build-ings, \$36,513,750, or 143.1 per cent; that of implements and machinery, \$2,-315,890, or 170.8 per cent; and that of live stock, \$30,541,146, or 141.3 per cent. The value of farm products for 1899 exceeds that reported for 1889 by \$22,343,542, or 356.2 per cent. A part of the large gain in the value of farm products shown for the last decade is due to the fact that the enumera-tion of 1900 was more detailed and complete than that made by any previous census. Among the items enumerated in 1900, but not in 1890, is the value of animals sold or slaughtered on farms, which for 1899 amounted to \$10,083,-646, nearly half the gain shown in the table for the last decade.
In 1880 and in 1890 domestic animals on ranges were not enumerated,

hence the values shown in the table are deficient for both these years. The value of animals on ranges in 1890 has been estimated at \$10,951,425, which would make the value of all live stock on farms and ranges \$32,572,112. Assuming this value to be comparable with that reported in 1900, there has been an increase in the last decade of 60.1 per cent.

County Statistics.

Table 3 gives an exhibit of general agricultural statistics by counties.

TABLE 3.-NUMBER AND ACREAGE OF FARMS, AND VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, JUNE 1, 1900, WITH VALUE OF PRODUCTS OF 1899 NOT FED TO LIVE STOCK, AND EXPENDITURES IN 1899 FOR LABOR AND FERTILIZERS, BY COUNTIES.

COUNTIES	NO. OF FARMS		ACRES IN FARMS		VALUES OF FARM PROPERTY					Value of Products Not Fed to Live Stock	EXPENDITURES	
	Total	With Build-ings	Total	Improved	Land and Improve-ments (Ex-cept Build-ings)	Buildings	Imple-ments and Machinery	Live Stock	Labor		Fertil-izers	
The State	13,370	12,878	11,841,454	1,736,701	\$52,660,560	\$9,365,530	\$3,671,940	\$52,161,833	\$23,542,227	\$5,077,340	\$3,940	
Beaverhead	518	462	385,635	168,451	2,884,060	342,390	153,131	2,072,228	1,095,278	281,450	130	
Broadwater	222	216	103,799	49,484	955,900	179,180	66,810	929,440	489,971	85,950	10	
Carbon	871	851	151,938	77,165	1,528,210	336,020	188,663	1,545,622	844,542	111,380	30	
Cascade	1,144	1,118	769,743	118,911	3,738,200	723,230	36,020	3,021,148	1,577,663	339,200	100	
Choteau	762	725	546,236	90,242	2,347,680	574,380	224,440	5,977,041	1,823,063	543,750	25	
Custer	804	706	642,563	90,359	1,915,430	428,780	170,610	7,137,325	2,454,061	387,850	30	
Dawson	259	238	56,402	19,645	124,340	119,430	56,930	2,647,016	408,512	124,460	.....
Deer Lodge	564	556	359,518	92,489	2,532,220	487,220	155,720	1,519,157	1,007,270	205,750	590	
Fergus	732	718	704,860	121,389	3,227,100	584,630	237,930	4,464,657	1,891,934	534,390	50	
Flathead	767	756	160,546	64,109	1,768,410	408,270	157,050	499,954	830,357	73,000	50	
Gallatin	950	934	368,706	172,287	4,609,400	707,310	295,590	1,054,990	1,399,404	174,240	50	
Granite	205	198	65,764	26,272	617,980	167,540	57,010	430,429	301,998	54,260	150	
Jefferson	235	234	74,385	23,176	724,310	187,950	45,990	487,162	221,192	36,280	.....
Lewis and Clarke	531	521	443,125	63,682	2,407,740	411,740	134,930	1,658,958	838,489	193,600	680	
Madison	674	652	317,206	111,836	2,521,360	667,990	170,330	2,285,125	1,000,589	203,490	200	
Meagher	198	189	599,504	52,419	1,666,620	272,180	75,150	2,265,271	946,541	228,320	.....
Missoula	615	610	148,603	47,982	1,673,630	390,840	122,780	646,778	549,095	95,570	200	
Park	532	521	258,810	44,566	1,410,760	276,640	112,600	1,109,548	699,442	106,600	100	
Ravalli	891	880	177,652	81,012	2,888,510	711,630	178,130	1,466,608	900,386	287,780	.....
Silver Bow	215	215	47,814	13,383	434,560	163,670	39,490	316,800	316,193	73,550	20	
Sweet Grass	402	383	380,188	39,495	1,398,720	327,040	100,460	1,922,485	795,848	236,960	50	
Teton	347	325	274,074	49,768	1,336,340	260,130	99,350	3,035,450	928,111	270,480	75	
Valley	226	198	66,306	21,278	244,230	107,970	22,990	1,944,605	402,053	109,720	50	
Yellowstone	383	356	1,184,916	58,024	2,258,300	353,810	116,900	2,642,538	1,441,520	286,020	.....
Blackfeet*	36	36	5,000	5,000	11,300	13,700	30,000	169,908	26,247	.....	.....
Crow*	1	1	3,500,000	10,891	6,975,000	25,000	300,000	334,400	141,025	.....	.....
Flathead*	150	146	27,960	13,420	260,470	72,060	26,950	492,425	179,030	28,280	.....
Fort Peck*	119	117	9,698	7,433	92,410	33,420	23,210	38,276	11,372	690	.....
Northern Cheyenne*	17	16	10,720	2,443	107,340	31,380	2,790	46,489	21,036	3,650	.....

* Indian reservation.

On account of the many territorial changes in Montana during the last decade, it is impossible to make accurate comparisons of the variations between 1890 and 1900 in many of the counties. Except in one instance there have been no decreases reported in the last ten years in counties not undergoing territorial changes.

The average size of farms in Montana is 885.9 acres. This high average is due in part to the fact that the report included a large farm acreage from the Crow Indian reservation, which has not yet been allotted and was reported as one farm. The average varies from 174.5 acres in Carbon county to 3,093.8 acres in Yellowstone county.

The average value of farms for the state is \$4,639. In Choteau, Custer and Yellowstone counties the value of farms is approximately four times as large, and in Dawson and Fergus counties the value was over twice as large as in 1890. Jefferson, Missoula, and Park counties report decreases in the value of live stock.

The expenditure for labor on each farm in 1899 averaged \$380. It was much greater in the cattle-raising counties, in the eastern half of the state, than in those of the western part. The expenditure for fertilizers in 1899 was less than in 1889, most counties reporting a very small amount.

Farm Tenure.

Table 4 gives a comparative exhibit of farm tenure for 1880, 1890, and 1900. Tenants are divided into two groups: "Cash tenants," who pay a rental in cash or in a stated amount of labor or farm produce, and "share tenants," who pay as rental a stated share of the products.

In Table 5 the tenure of farms for 1900 is given by race of farmer, and "farms operated by owners" are subdivided into groups designated as "owners," "part owners," "owners and tenants," and "managers." These terms denote, respectively: (1) Farms operated by individuals who own all the land they cultivate; (2) farms operated by individuals who own a part of the land and rent the remainder from others; (3) farms operated under the joint direction and by the united labor of two or more individuals, one owning the farm or a part of it and the other or others owning no part but receiving for supervision or labor a share of the products; and (4) farms operated by individuals who receive for their supervision and other services a fixed salary from the owners.

TABLE 4.—NUMBER AND PER CENT OF FARMS OF SPECIFIED TENURES:
1880 TO 1900.

YEAR	Total Number of Farms	NUMBER OF FARMS OPER- ATED BY—			PER CENT OF FARMS OPER- ATED BY—		
		Owners*	Cash Tenants	Share Tena'ts	Ow- ners*	Cash Tenants	Share Tenants
1900	13,370	12,140	624	606	90.8	4.7	4.5
1890	5,603	5,333	124	146	95.2	2.2	2.6
1880	1,519	1,439	17	63	94.7	1.1	4.2

* Including "part owners," "owners and tenants," and "managers."

TABLE 5.—NUMBER AND PER CENT OF FARMS OF SPECIFIED TENURES,
JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER.
Part 1.—NUMBER OF FARMS OF SPECIFIED TENURES.

RACE	Total Number of Farms	Owners	Part Owners	Owners and Tenants	Mana- gers	Cash Ten- ants	Share Ten- ants
The State	13,370	10,402	1,190	69	479	624	606
White	13,042	10,108	1,185	69	479	598	603
Colored	328	294	5			26	3
Chinese	26	1				23	2
Indian	281	275	5			1	
Negro	21	18				2	1

Part 1.—NUMBER OF FARMS OF SPECIFIED TENURES.

The State	100.0	77.8	8.9	0.5	3.6	4.7	4.5
White	100.0	77.5	9.1	0.5	3.7	4.6	4.6
Colored	100.0	89.7	1.5			7.9	0.9

In the last decade the number of farms operated by owners has increased 6,807, or 127.6 per cent; the number operated by tenants has increased 960, or nearly four times. In 1890, 4.8 per cent of farmers were tenants, and in 1900, 9.2 per cent. The percentages in Table 4 indicate that although the number of tenants is small, the increase in this group has been relatively more rapid than that for owners. Of the total number of farmers, 97.5 per cent are white, and 2.5 per cent, colored. The latter class includes 281 Indians, all but six of whom are owners. The farm land of the Crow Indian reservation was enumerated as one farm with the agent in charge as manager, though many Indians were engaged in agricultural work on the land, and the operations were carried on primarily for their benefit.

Farms Classified by Race of Farmer and by Tenure.

Tables 6 and 7 present the principal statistics for farms classified by race of farmer and by tenure.

TABLE 6.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM
PROPERTY, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER AND BY
TENURE, WITH PERCENTAGES.

Race of Farmer and Tenure	Number of farms	Number of Acres in Farms			Value of Farm Property.	
		Average	Total	Per cent.	Total	Per cent.
The State	13,370	855.9	11,844,454	100.0	\$117,859,833	100.0
White farmers	13,042	904.9	11,801,728	99.6	116,727,511	99.0
Negro farmers	21	210.0	4,410		46,672	
Indian farmers	281	130.1	36,554	0.4	1,010,158	1.0
Chinese farmers	26	67.8	1,762		75,482	
Owners	10,402	332.3	3,456,624	29.2	59,109,845	50.2
Part owners	1,190	1,784.9	2,124,071	17.9	21,654,416	18.4
Owners and tenants	69	731.7	50,439	0.4	675,152	0.6
Managers	479	11,171.2	5,351,005	45.2	28,693,380	24.3
Cash tenants	624	1,083.8	676,260	5.7	4,259,657	3.6
Share tenants	606	306.9	186,005	1.6	3,467,373	2.9

TABLE 7.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY RACE OF FARMER AND BY TENURE.

RACE OF FARMER, AND TENURE	AVERAGE VALUES PER FARM OF—					Per cent. of gross income on total investment in farm property
	Farm property, June 1, 1900				Gross income (pro- ducts of 1899 not fed to live stock)	
	Land and Im- provements (except buildings)	Buildings.. . . .	Implements and Machinery.....	Live Stock.....		
The State	\$3,939	\$700	\$275	\$3,901	\$1,761	20.0
White farmers	4,007	711	275	3,957	1,789	20.0
Negro farmers	1,423	263	130	407	492	22.1
Indian farmers	1,126	282	262	1,924	590	16.4
Chinese farmers	2,209	189	158	348	1,343	46.3
Owners	2,442	561	214	2,466	1,145	20.1
Part owners	7,454	1,294	442	9,007	3,569	19.6
Owners and tenants	4,550	777	311	4,147	1,903	19.4
Managers	27,619	2,420	1,313	28,551	11,926	19.9
Cash tenants	4,176	630	211	1,809	1,304	19.1
Share tenants	3,693	636	230	1,163	1,209	21.1

Of the total number of farms in Montana, 281 were operated by Indians, 26 by Chinese, and 21 by negroes. Collectively they controlled 0.4 per cent of the total farm acreage, and 1.0 per cent of the total value of farm property.

The average values of all forms of farm property are less for colored than for white farmers. The higher per cent of gross income for negro farmers does not indicate superior management, but is due to the very low average values of their farms and the more intensive cultivation prevalent on smaller farms. The farms of the Indians are generally live-stock farms with little income, while those of the Chinese are small but intensively cultivated market gardens, located near cities or towns and yielding a high rate of gross income. Farms operated by managers have the highest average values of all forms of farm property, but the ratio which the gross income bears to the total value of the farm porperty does not vary far from the state average.

Farms Classified by Area.

Tables 8 and 9 present the principal statistics for farms classified by area.

TABLE 8.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY AREA WITH PERCENTAGES

AREA	Number of Farms	NUMBER OF ACRES IN FARMS			VALUE OF FARM PROPERTY	
		Aver- age	Total	Per Cent	Total	Per Cent
The State	13,370	885.9	11,844,454	100.0	\$117,859,823	100.0
Under 3 acres	417	1.0	421	(*)	3,894,291	3.3
3 to 9 acres	118	8.5	1,007	(*)	201,334	0.2
10 to 19 acres	118	18.8	2,216	(*)	177,028	0.2
20 to 49 acres	399	40.7	16,251	0.1	988,045	0.8
50 to 99 acres	563	77.2	43,476	0.4	1,923,697	1.6
100 to 174 acres	5,613	157.1	882,023	7.5	17,995,989	15.3
175 to 259 acres	878	219.6	192,813	1.6	5,165,584	4.4
260 to 499 acres	2,718	354.9	964,642	8.1	17,855,371	15.1
500 to 999 acres	1,257	716.1	900,121	7.6	14,514,488	12.3
1,000 acres and over	1,239	6,859.2	8,841,484	74.7	55,143,993	46.8

* Less than one-tenth of 1 per cent.

TABLE 9.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY AREA.

AREA	AVERAGE VALUES PER FARM OF					Per Cent of Gross Income on Total Invest- ment in Farm Property
	Farm property, June 1, 1900				Gross In- come (Products of 1899 Not Fed to Live Stock	
	Land and Improve- ments (Except Buildings	Build- ings	Imple- ments and Ma- chin- ery	Live Stock		
The State	\$3,939	\$700	\$275	\$3,901	\$1,761	20.0
Under 3 acres	47	244	74	8,974	3,757	40.2
3 to 9 acres	859	484	85	278	394	23.1
10 to 19 acres	574	394	81	451	347	23.1
20 to 49 acres	976	371	111	1,018	613	24.7
50 to 99 acres	1,424	500	185	1,308	1,157	33.9
100 to 174 acres	1,394	377	159	1,276	641	20.0
175 to 259 acres	2,681	623	232	2,347	1,624	27.6
260 to 499 acres	3,226	673	270	2,400	1,256	19.1
500 to 999 acres	5,610	1,045	368	4,524	2,064	17.9
1,000 acres and over	19,614	2,264	914	19,985	7,724	18.1

The group of farms comprising from 100 to 174 acres each, includes the largest number of farms showing the frequency of quarter-section holdings, but the group containing 1,000 acres and over constitutes a far larger part of the total acreage and value than any other.

With few exceptions, the average values of the several forms of farm property increase with the size of the farms. The high average value of live stock, and the large gross income for farms under 3 acres are due to the fact that most of this group are live-stock farms, whose operators use public lands for range purposes and a few are market gardens and dairy farms. The incomes from these industries depend less upon the acreage of owned or rented land used, than upon the capital invested in buildings, implements, and live stock, and the expenditure for labor and fertilizers.

The average gross incomes per acre for the various groups classified by area are as follows: Farms under 3 acres, \$3,721.38; 3 to 9 acres, \$46.23; 10 to 19 acres, \$18.44; 20 to 49 acres, \$15.04; 50 to 99 acres, \$14.99; 100 to 174 acres, \$4.08; 175 to 259 acres, \$7.39, 260 to 499 acres, \$3.54; 500 to 999 acres, \$2.88; and 1,000 acres and over, \$1.13.

Farms Classified by Principal Source of Income.

Tables 10 and 11 present the leading features of the statistics relating to farms classified by principal source of income. If the value of the hay and grain raised on any farm exceeds that of any other crop and constitutes at least 40 per cent of the total value of products not fed to live stock, the farm is classified as a "hay and grain" farm. If vegetables are the leading crop, constituting 40 per cent of the value of the products, it is a "vegetable" farm. The farms of the other groups are classified in accordance with the same general principle. "Miscellaneous" farms are those whose operators do not derive 40 per cent of their income, from any one class of farm products. Farms which yielded no income in 1899 are classified according to the agricultural operations upon other farms in the same locality.

TABLE 10.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME, WITH PERCENTAGES.

Principal Source of Income	Number of Farms	Number of Acres in Farms			Value of Farm Property	
		Average	Total	Per cent.	Total	Per Cent.
The State	13,370	885.9	11,844,454	100.0	\$117,859,823	100.0
Hay and grain	3,848	404.1	1,554,918	13.1	24,029,946	20.4
Vegetables	609	187.6	114,272	1.0	1,770,893	1.5
Fruits	79	270.3	21,352	0.2	413,095	0.3
Live stock	6,048	1,578.0	9,543,538	80.6	82,708,374	70.2
Dairy produce	1,153	242.6	279,759	2.3	4,416,310	3.7
Flowers and plants	11	1.0	11	(*)	61,375	0.1
Nursery products	5	150.8	754	(*)	60,605	0.1
Miscellaneous	1,617	204.0	329,850	2.8	4,399,255	3.7

* Less than one-tenth of 1 per cent.

TABLE 11.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

PRINCIPAL SOURCE OF INCOME	AVERAGE VALUE PER FARM OF—					Per Cent of Gross Income on Total Investment in Farm Property
	Farm Property, June 1, 1900				Gross Income (Products of 1899 Not Fed to Live Stock)	
	Land and Improvements (Except Buildings)	Buildings	Implements and Machinery	Live Stock		
The State	\$3,935	\$700	\$275	\$3,901	\$1,761	20.0
Hay and grain	4,240	716	285	1,004	1,075	17.2
Vegetables	1,819	429	150	510	636	21.9
Fruits	3,669	822	178	560	827	15.8
Live stock	4,979	825	333	7,538	2,857	20.9
Dairy produce	1,842	557	200	1,231	790	20.6
Flowers and plants	3,309	2,182	64	25	2,744	49.2
Nursery products	9,000	2,520	113	488	3,977	32.8
Miscellaneous	1,625	378	139	579	444	16.3

For the several classes of farms, the average values per acre of products not fed to live stock are as follows: Farms whose operators derive their principal income from flowers and plants, \$2743.82; nursery products, \$26.37; vegetables, \$3.39; dairy produce, \$3.25; fruits, \$3.06; hay and grain, \$2.66; miscellaneous, \$2.18 and live stock, \$1.81.

The variations shown in the averages and percentages of gross income are largely due to the fact that in computing gross incomes no deductions are made for expenditures. The average expenditure for such items as labor and fertilizers upon fruit and vegetables farms, represents a far larger percentage of the gross income than in the case of "hay and grain," "live-stock," or "miscellaneous" farms. Were it possible to present the average net incomes, the variations shown would be comparatively slight.

Farms Classified by Reported Value of Products not Fed to Live Stock.

Tables 12 and 13 present data relating to farms classified by reported value of products not fed to live stock.

TABLE 12.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK, WITH PERCENTAGES.

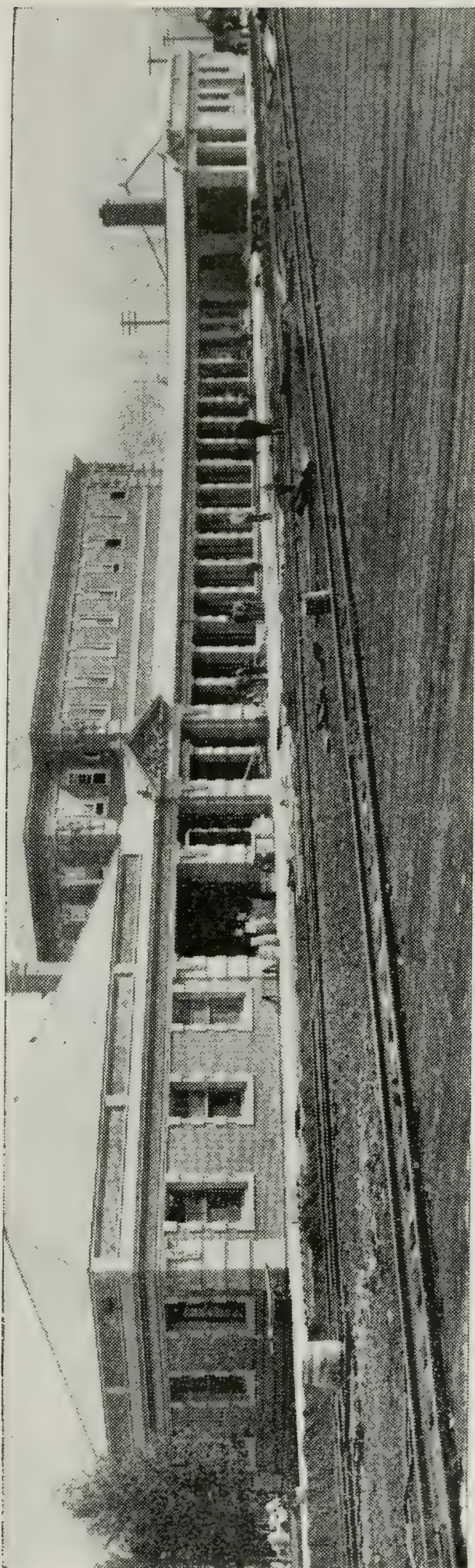
VALUE OF PRODUCTS NOT FED TO LIVE STOCK	No of Farms	NO. OF ACRES IN FARMS			VALUE OF FARM PROPERTY	
		Aver- age	Total	Per Cent	Total	Per Cent
The State	13,370	885.9	11,844,454	100.0	\$117,859,823	100.0
\$0	927	221.8	205,652	1.7	3,029,690	2.6
\$1 to \$49	370	224.1	82,930	0.7	763,100	0.6
\$50 to \$99	508	192.3	97,678	0.8	1,059,780	0.9
\$100 to \$249	1,583	230.5	364,832	3.1	4,152,300	3.5
\$250 to \$499	2,088	222.2	463,895	3.9	6,187,490	5.2
\$500 to \$999	2,862	280.9	803,963	6.8	12,202,840	10.4
\$1,000 to \$2,499	3,005	522.2	1,569,081	13.3	24,992,970	21.2
\$2,500 and over	2,027	4,073.2	8,256,423	69.7	65,471,653	55.6

TABLE 13.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK.

Value of Products not fed to live stock	Average Values per farm of—					Percent. of gross income on total investment in farm property.
	Farm property, June 1, 1900				Gross income, pro- ducts of 1899 not fed to live stock.	
	Land and im- provements, ex- cept buildings	Buildings	Implements and machinery.	Live Stock		
The State	\$3,939	\$700	\$275	\$3,901	\$1,761	20.0
\$0	942	209	80	2,037	.....	.....
\$1 to \$49	1,034	210	94	724	48	2.3
\$50 to \$99	1,018	235	166	667	58	2.8
\$100 to \$249	1,402	313	119	789	160	6.1
\$250 to \$499	1,522	395	145	901	347	11.7
\$500 to \$999	2,283	498	202	1,281	590	13.8
\$1,000 to \$2,499	4,445	897	333	2,642	1,515	18.2
\$2,500 and over	12,629	1,743	695	17,233	8,031	24.9

Of the 927 farms reporting no income in 1899, 516 were farms of from 100 to 175 acres each, and 87.3 per cent of them were operated by owners. This would indicate that they were homesteads taken up too late for cultivation in 1899.

There were some farms, also, from which no reports of the products of 1899 could be secured, as the persons in charge, June 1, 1900, did not operate the farms during the preceding year. To this extent the reports fall short of giving a complete statement of farm products in 1899.



NEW NORTHERN PACIFIC DEPOT AT LIVINGSTON

Live Stock.

At the request of the various live-stock associations of the country, a new classification of domestic animals was adopted for the census of 1900. The age grouping for neat cattle was determined by their present and prospective relations to the dairy industry and the supply of meat products. Horses and mules are classified by age, and neat cattle and sheep by age and sex. The new classification permits a very close comparison with previous census reports.

Table 14 presents a summary of live-stock statistics.

TABLE 14.—DOMESTIC ANIMALS, FOWLS, AND BEES, ON FARMS AND RANGES, JUNE 1, 1900, WITH TOTAL AND AVERAGE VALUES, AND NUMBER OF DOMESTIC ANIMALS NOT ON FARMS OR RANGES.

LIVE STOCK	Age in Years	ON FARMS AND RANGES			Not on Farms or Ranges.. No.
		Num- ber	Value	Av. Val- ue	
Calves	Under 1	187,533	\$2,229,419	\$11.89	1,301
Steers	1 and under 2.	113,179	2,396,473	21.17	341
Steers	2 and under 3	113,368	3,379,211	29.81	207
Steers	3 and over ...	85,303	3,411,580	39.99	256
Bulls	1 and over ...	14,556	785,577	53.97	38
Heifers	1 and under 2.	97,899	2,002,199	20.45	354
Cows kept for milk	2 and over ...	45,036	1,886,580	41.89	3,281
Cows and heifers not kept for milk	2 and over ...	311,513	9,270,977	29.76	680
Colts	Under 1	39,838	364,743	9.16	575
Horses	1 and under 2.	44,850	839,334	18.71	650
Horses	2 and over ...	245,284	6,584,595	26.84	(e)
Mule colts..	Under 1	576	12,806	22.23	34
Mules	1 and under 2.	404	12,021	29.75	6
Mules	2 and over ...	1,749	77,914	44.55	321
Asses and burros	All ages	128	16,008	125.06	17
Lambs....	Under 1	1,955,269	3,806,529	1.95	26
Sheep (ewes)	1 and over ...	2,995,795	10,105,384	3.37	14
Sheep (rams and wethers)	1 and over ...	1,219,419	4,253,491	3.49	57
Swine	All ages	49,496	281,402	5.69	933
Goats	All ages	1,713	7,870	4.59	10
Fowls*					
Chickens**		531,774			
Turkeys		12,637			
Geese		2,629	296,806		
Ducks.....		9,639			
Bees (swarmed)		1,801	8,139	4.52	....
Unclassified			132,775		....
Value of all live stock			52,161,833		....

(e) 16,050.
* The number reported is of fowls over 3 months old. The value is for all, old and young.
** Including Guinea fowls.

The total value of all live stock on farms and ranges, June 1, 1900, was \$52,161,833, of which 45.0 per cent represents the value of neat cattle, exclusive of dairy cows; 34.8 per cent, that of sheep; 14.9 per cent, that of horses; 3.6 per cent that of dairy cows; 0.6 per cent that of poultry; and 1.1 per cent, the value of all other live stock.

The average value of horses is low, because the Indian ponies on four reservations are included in the report. These ponies number thousands, and are valued at from \$3 to \$10 per head. The unusually high average value

of calves is due in part to the great demand for beef cattle in the period just preceding the enumeration, which resulted in the thinning of the herds and diminished increase of young stock.

No reports were secured of the value of live stock not on farms and ranges, but it is probable such animals have higher average values than farm or range animals. Allowing the same averages, however, the total value of domestic animals not on farms is \$677,287, or 1.3 per cent of the total value of farm live stock. Exclusive of poultry and bees not on farms, the total value of live stock in the state is approximately \$52,839,120.

Changes in Live Stock Kept on Farms and Ranges.

The following table shows the changes since 1850 in the numbers of the most important domestic animals.

TABLE 15.—NUMBER OF SPECIFIED DOMESTIC ANIMALS ON FARMS AND RANGES: 1870 TO 1900.

YEAR	Dairy Cows	Other Neat Cattle	Horses	Mules and Asses	Sheep*	Swine
1900	45,036	923,351	329,972	2,857	4,215,214	49,496
1890**	24,143	667,755	142,959	959	1,859,016	17,132
1880**	11,308	161,079	35,114	858	184,277	10,278
1870	12,432	24,306	5,289	475	2,024	2,599

* Not including lambs.

** Exclusive of live stock on ranges.

The live-stock enumeration in 1880 and 1890 did not include domestic animals on ranges, hence, the figures presented in the table for those years are not strictly comparable with the figures for 1900. The numbers of animals on ranges in 1890 were estimated by special agents to be as follows: All neat cattle, 750,619; horses, 32,939; mules and asses, 145; sheep, 493,870; swine, 19. In the following comparisons between the number of animals reported in 1900 and the number reported in 1890, these estimates are disregarded.

The number of dairy cows reported, June 1, 1900, was nearly four times as great as the number reported in 1870, the increase between 1890 and 1900 being 86.5 per cent. The number of other neat cattle in 1900 includes 187,533 calves; and, as it is uncertain whether any calves were reported under this head in 1890, the increase shown for "other neat cattle" in the last decade is probably somewhat less than the figures indicate.

The number of horses reported in 1900 was sixty-five times as great as in 1870 and more than twice as great as in 1890. Sheep received little attention before 1870, but between 1880 and 1890 the number increased ninefold, and in the next decade it more than doubled. In 1900 nearly three times as many mules and asses were reported as in 1890. The number of swine reported increased rapidly in each decade, nearly three times as many being reported in 1900 as in 1890.

Notwithstanding the fact that in 1900 the enumerators were instructed to report on fowls under three months old, and that no such limitation was made in previous census reports, the census of 1900 shows more than twice

as many chickens, turkeys, and ducks, and more than three times as many geese, as were reported in 1890.

Annual Products.

Table 16 is a summarized exhibit of the products of the animal industry.

TABLE 16.—QUANTITIES AND VALUES OF SPECIFIED ANIMAL PRODUCTS, AND VALUES OF POULTRY RAISED, ANIMALS SOLD, AND ANIMALS SLAUGHTERED, ON FARMS AND RANGES IN 1899.

PRODUCTS	Unit of measure	Quantity	Value
Wool	Pounds	30,437,829	\$5,136,658
Mohair and goat hair	Pounds	2,750	824
Milk	Gallons	*15,696,214	
Butter	Pounds	2,454,072	**1,669,978
Cheese	Pounds	30,924	
Eggs	Dozens	3,002,890	631,143
Poultry .....	.....	.....	398,487
Honey	Pounds	19,940	
Wax	Pounds	130	3,706
Animals sold .....	.....	.....	9,176,830
Animals sloughtered .....	.....	.....	906,816
Total .....	.....	.....	\$17,924,442

* Comprises all milk produced, whether sold, consumed, or made into butter or cheese.

** Comprises the value of butter and cheese, and of all milk sold or consumed.

The value of animal products reported in 1899 was \$17,924,442. Of this value 51.2 per cent represents the value of animals sold; 5.0 per cent, that of animals slaughtered; 28.7 per cent, that of wool, mohair, and goat hair; 9.3 per cent, that of dairy products; and 5.8 per cent, that of poultry, eggs, honey, and wax.

Dairy Produce.

The production of milk in 1899 was twice as great as in 1889. The production of butter on farms more than doubled, and that of cheese nearly trebled, in the decade.

Of the \$1,669,978 given in Table 16 as the value of all dairy products in 1899, \$727,803, or 43.6 per cent, represents the value of such products consumer on farms, and \$942,175, or 54.4 per cent, the amount realized from sales. Of the latter amount, \$611,496 was derived from the sale of 3,162,568 gallons of milk; \$291,907, from 1,204,339 pounds of butter; \$35,335, from 32,863 gallons of cream; and \$3,437, from 21,532 pounds of cheese.

Animals Sold or Slaughtered.

The value of animals sold or slaughtered on farms was \$10,083,646, or 42.8 per cent of the gross farm income. Of all the farms reporting domestic animals,6,689 farms, or 51.9 per cent, report sales of live animals, the average receipts per farm being \$1,371.93; and 5,616 farms, or 43.6 per cent of the total number, report animals slaughtered, the average value per farm being \$161.47. In obtaining these reports the enumerators were instructed to secure from each farm operator a statement of the receipts from sales of live animals in 1899, less the amount paid for animals purchased during the same year.

Poultry and Eggs.

The total value of the products of the poultry industry in 1899 was \$1,029,630, of which amount 38.7 per cent represents the value of fowls raised

and 61.3 per cent that of eggs produced. Nearly four times as many eggs were produced in 1899 as in 1889.

Wool.

The production of wool has increased very rapidly since 1870. The clip of 1899 was 30,437,829 pounds, or about three times as great as in 1889.

Bees and Honey.

The quantity of honey reported in 1890 was but 20 pounds, with no wax; while in 1899, 19,940 pounds of honey and 130 pounds of wax were produced.

Horses and Dairy Cows on Specified Classes of Farms.

Table 17 presents, for the leading groups of farms, the number of farms reporting horses and dairy cows, the total number of these animals, and the average number per farm. In computing the averages presented, only those farms which report the kind of stock under consideration are included.

TABLE 17.—HORSES AND DAIRY COWS ON SPECIFIED CLASSES OF FARMS
JUNE 1, 1900.

CLASSES	Horses			Dairy Cows		
	Farms Report- ing	Number	Average per farm	Farms Report- ing	Number	Average per farm
Total	12,464	329,972	26.5	9,526	45,036	4.7
White farmers	12,166	321,549	26.4	9,418	44,591	4.7
Colored farmers	298	8,423	28.3	108	445	4.1
Owners*.....	11,004	237,141	21.6	8,314	38,163	4.6
Managers	413	71,281	172.6	315	2,700	8.6
Cash tenants	477	14,631	30.7	441	2,591	5.9
Share tenants	570	6,919	12.1	456	1,582	3.5
Under 20 acres	526	18,823	35.8	302	1,614	5.3
20 to 99 acres	868	8,488	9.8	643	2,669	4.2
100 to 174 acres	5,152	76,429	14.8	3,718	14,563	3.9
175 to 259 acres	840	12,437	14.8	673	3,134	4.7
260 acres and over	5,078	213,795	42.1	4,190	23,056	5.5
Hay and grain	3,488	44,925	12.9	2,617	9,189	3.5
Vegetable	546	4,151	7.6	334	912	2.7
Fruit	67	392	5.9	52	128	2.5
Live stock	5,826	257,190	44.1	4,385	20,327	4.6
Dairy produce ...	1,104	11,512	10.4	1,153	11,293	9.8
Miscellaneous**	1,433	11,802	8.2	985	3,187	3.2

* Including "part owners" and "owners and tenants."

** Including florists' establishments and nurseries.

Crops.

The following table gives the statistics of the principal crops of 1899.

TABLE 18.—ACREAGE, QUANTITIES, AND VALUES OF THE PRINCIPAL FARM CROPS IN 1899.

Crops	Acres	Unit of measure	Quantity	Value
Corn	3,301	Bushels	75,838	\$41,626
Wheat	91,232	Bushels	1,899,683	1,077,210
Oats	133,938	Bushels	4,746,231	1,790,938
Barley	22,848	Bushels	844,140	341,308
Rye	2,003	Bushels	33,120	16,546
Buckwheat	9	Bushels	168	98
Flax seed	16	Bushels	220	263
Clover seed .....	.....	Bushels	374	1,963
Grass seed .....	.....	Bushels	852	1,719
Hay and forage	875,712	Tons	1,059,361	5,974,850
Tobacco	1	Pounds	200	60
Dry beans	101	Bushels	1,110	2,221
Dry peas	1,512	Bushels	32,265	23,273
Potatoes	9,613	Bushels	1,332,062	661,163
Onions	151	Bushels	29,113	22,612
Miscellaneous vegetables ..	4,121	.....	.....	356,180
Sorghum syrup	*2	Gallons	100	70
Small fruits..	*554	.....	.....	79,891
Orchard fruits	**5,571	Bushels	45,192	***59,414
Grapes	**10	Centals	13	****173
Nuts .....	.....	.....	.....	.....
Forest products ....	.....	.....	.....	176,134
Flowers and plants	17	.....	.....	33,630
Nursery products	62	.....	.....	17,825
Miscellaneous ....	.....	.....	.....	*****3,343
Total	1,151,674	.....	.....	\$10,692,515

* Sorghum cane.
** Estimated from number of vines or trees.
*** Including value of cider, vinegar, etc.
**** Including value of wine, raisins, etc.
***** This value was derived from products for which no acreage was reported.

Of the total value of crops in 1899, hay and forage, with 76.0 per cent of the total acreage, contributed 55.9 per cent, while cereals, with but 22.1 per cent of the total acreage, furnished 30.6 per cent of the total value. The percentages of the total value contributed by the remaining crops are as follows: Vegetables, including potatoes and onions, 9.7 per cent; fruits and forest products, 2.9 per cent; and all other products, 0.9 per cent.

The average values per acre for the various crops were as follows: Flowers and plants, \$1,978.24; nursery stock, \$287.50; onions, \$149.75; small fruits, \$144.21; miscellaneous vegetables, \$86.43; potatoes, \$68.78; cereals, \$12.85; and hay and forage, \$6.82. The crops yielding the highest returns per acre were grown upon very highly improved land. Their production required a relatively great amount of labor, and large expenditures for fertilizers.

Cereals.

Table 19 is an exhibit of the changes in cereal production since 1869.

TABLE 19.—ACREAGE AND PRODUCTION OF CEREALS 1869 TO 1899.
Part 1.—Acreage.

YEAR*	Barley	Buck- wheat	Corn	Oats	Rye	Wheat
1899	22,848	9	3,301	133,938	2,003	92,132
1889	4,652	13	1,019	52,768	14	18,696
1879	1,323	34	197	24,691	15	17,665

* No statistics of acreage were secured prior to 1879.

Part 2.—BUSHEL PRODUCTION.

1899.....	844,140	168	75,838	4,746,231	33,120	1,899,683
1889.....	160,902	128	14,225	1,535,615	188	457,607
1879.....	39,970	437	5,649	900,915	430	469,688
1869	85,756	988	320	149,367	1,141	181,184

The development of agriculture in the western and southern parts of Montana during the past thirty years has resulted in a marked increase in the production of cereals. Since 1879 the total area devoted to cereals has increased from 43,925 acres to 254,231 acres. The total production of cereals increased from 418,756 bushels in 1869 to 7,599,180 bushels in 1899.

The largest acreages reported in 1900 were those of oats and wheat, each being more than five times as great in 1899 as in 1879. The acreages in barley and corn increased steadily, and, in 1899, were approximately seventeen times as great as in 1879. The area devoted to rye was nearly one hundred and thirty-four times as large as in 1879, but that under buckwheat decreased 73.5 per cent in the twenty years.

Oats, wheat, barley, and rye were reported in large quantities in the western and southern parts of the state, but the acreage under corn was greatest in the eastern counties. The few counties reporting buckwheat are in the southern part of the state.

Hay and Forage.

In 1900, 10,656 farmers, or 79.7 per cent of the total number, reported hay and forage crops. Exclusive of cornstalks and corn strippings, an average yield of 1.2 tons per acre was obtained. The acreage in hay and forage in 1899 was 191.9 per cent greater than ten years before.

In 1899 the acreages and yields of the various kinds of hay and forage were as follows: Wild, salt, or prairie grasses, 567,587 acres and 545,841 tons; millet and Hungarian grasses, 3,690 acres and 4,705 tons; alfalfa or lucern, 68,959 acres and 186,498 tons; clover, 12,498 acres and 22,630 tons; other tame and cultivated grasses, 180,178 acres and 237,950 tons; grains cut green for hay, 40,374 acres and 57,837 tons; forage crops, 2,426 acres and 3,807 tons; and cornstalks, 90 acres and 93 tons.

In Table 18 the production of cornstalks and corn strippings is included under "hay and forage," but the acreage is included under "corn," as the forage secured was an incidental product of the corn crop.

Orchard Fruits.

The changes in orchard fruits since 1890 are shown in the following table:

TABLE 20.—ORCHARD TREES AND FRUITS: 1890 AND 1900.

Fruits	Number of Trees		Bushels of Fruit	
	1900	1890	1899	1889
Apples	530,976	10,960	43,939	5,893
Apricots	193	.....	1	.....
Cherries	20,164	806	807	9
Peaches	1,670	.....	17	.....
Pears	8,422	370	24	2
Plums and Prunes	18,449	699	373	36

Orchard fruits were reported in 1900 by 597 farmers, or 4.5 per cent of the total number, nearly eighty per cent of the farms being in the four western counties of Flathead, Missoula, Ravalli, and Madison. The value of orchard products was not reported by the census of 1890, but in 1879 the value of all such products was \$1,530. For 1899 the corresponding value is \$59,414, a gain in twenty years of \$57,884.

Apple trees constituted 91.6 per cent of the fruit trees, shown in Table 20, and yielded 97.3 per cent of the fruit reported, the number of trees in 1900 being fifty times as great as in 1890. Cherries stand next to apples in importance, and plums and prunes third. These latter fruits together constitute only 6.7 per cent of the total number of orchard trees in the state, and yielded but 2.6 per cent of the total crop, but show large gains since 1890.

The growing of peach and apricot trees is of comparatively recent origin in the state, having sprung up within the last decade. In 1890 Missoula was the only county that reported pears, while in 1900, 8,422 pear trees were reported from eleven counties.

In addition to the trees given in Table 20, there were 807 unclassified fruit trees with a yield of 31 bushels of fruit. The value of orchard products given in Table 18 includes the value of 68 barrels of cider and 52 barrels of vinegar.

Vegetables.

The total area devoted to vegetables in 1899, including potatoes and onions, was 13,885 acres. Of this area, 69.2 per cent was devoted to potatoes, which were grown by almost one-half the farmers in the state, the average yield per acre, 138.6 bushels. In the decade from 1890 to 1900 the area devoted to potatoes increased from 4,204 to 9,613 acres, or 128.7 per cent.

The vegetables grown on 1,258 acres were reported in detail, but for 2,863 acres no detailed reports were received. The acreages devoted to the vegetables specifically reported were as follows: 418 acres, to cabbages; 198, to turnips; 196, to carrots; 142, to sweet corn; 103, to pease; and 201 to other vegetables. As a rule vegetables were grown for home use only, but in the vicinity of the larger cities there are a few market gardens, some of them conducted by Chinese.

Small Fruits.

The total area used in the cultivation of small fruits in 1899 was 554 acres, distributed among 1,374 farms. Of this area, 281 acres, or 50.7 per cent, were devoted to strawberries, the total production of which was 532,260 quarts. They were grown principally in Ravalli and Missoula counties. The acreages and production of other berries were as follows: Currants, 120 acres and 252,860 quarts; raspberries and Logan berries, 80 acres and 110,795 quarts; gooseberries, 51 acres and 115,390 quarts; blackberries and dewberries, 18 acres and 17,970 quarts; and other berries, 4 acres and 4,610 quarts.

The values of the small fruits grown was \$79,891, an average of \$58.14 per farm. Of the total value, 62.0 per cent was contributed by Flathead, Ravalli, and Missoula counties.

Floriculture.

The area devoted to the cultivation of flowers and ornamental plants in 1899 was 17 acres, and the values of the products sold therefrom was \$33,630. These flowers and plants were grown by 19 farmers and florists, of whom 11 made commercial floriculture their principal business. These 11 proprietors reported a glass surface of 107,100 square feet. They had invested in land, buildings, implements, and live stock, \$61,375, of which \$24,000 represents the value of buildings. Their sales of flowers and plants amounted to \$30,132, and of other products, \$50. They expended \$8,770 for labor and \$222 for fertilizers. The average gross income per farm was \$2,744.

In addition to the 11 principals florists' establishments, 50 farms and market gardens made use of glass in the propagation of flowers, plants, or vegetables. They had an area under glass of 36,155 square feet, making, with the 80,325 square feet belonging to the florists' establishments, a total of 116,480 square feet.

Nurseries.

The total value of nursery products sold in 1899 was \$17,825, reported by the operators of 13 farms and nurseries. Of this number, 5 derived their principal income from the nursery business. They had 754 acres of land, valued at \$45,000, and buildings, implements, and live stock, valued at \$15,605. The value of their products not fed to live stock in 1899 was \$19,885, of which \$16,710 represents the value of nursery stock, and \$3,175 that of other products. The expenditure for labor was \$1,450 and for fertilizers, \$60. The average income for each farm reporting (including products fed to live stock) was \$3,998.

Labor and Fertilizers.

The total expenditure for labor on farms in 1899, including the value of board furnished, was \$5,077,340, an average of \$380 per farm. The average expenditure was \$797 for florists' establishments, \$634 for live-stock farms, \$290 for nurseries, \$228 for hay and grain farms, \$151 for dairy farms, \$120 for fruit farms, and \$108 for vegetable farms. "Managers" expended on an average, \$2,886; "cash tenants," \$253; "owners," \$215; and share tenants," \$170. White farmers expended \$386 per farm, and colored farmers, \$122.

Fertilizers purchased in 1899 amounted to only \$3,940, an average of

about 30 cents per farm and a decrease since 1890 of \$817. The average expenditure was \$20 for florists' establishments, \$12 for nurseries, \$2 for fruit farms, and \$1 for vegetable farms.

AGRICULTURE ON INDIAN RESERVATIONS.

Montana, which was once the famous hunting ground and battlefield of many Indian tribes, is now the quiet home of many of those same tribes which are slowly adopting the customs and occupations of the white man. Here are found the Piegan, Crow, Flathead, Sioux, Assiniboin, Grosventre, Northern Cheyenne, and a few small bands of other tribes. They are collected on six reservations, namely, Blackfeet, Crow, Flathead, Fort Belknap, Fort Peck, and Northern Cheyenne.

Their principal occupations are agriculture and stock raising; the latter industry is receiving the greater attention at present, as all the reserves have ample ranges, fairly well watered. But little of their land is cultivable without irrigation, and, as the Crows alone have an adequate, scientific system, farming operations are very limited among the other tribes, and progress in that industry is necessarily very slow.

Blackfeet reservation, the most northern of all reservations, is located in the northwestern part of Montana and contains an area of 2,750 square miles. The Indians here are the Piegan, with a few Blood and Blackfeet, all of Algonquin stock, numbering 2,256. The land consists principally of foothills, valleys, and rolling prairies, naturally adapted to grazing. The seasons have proven too short, in this high altitude, for successful agriculture, although there are a few sheltered spots, where, in favorable seasons, vegetables and some cereals will mature with irrigation.

Irrigation at this reserve has been neither systematic nor scientific; here and there the Indians have done considerable ditch work with the assistance of an engineer to run the lines, one ditch constructed in 1898 having a length of 7 miles. Many of the ditches are out of repair, while others are entirely worthless. The necessity for scientific irrigation grows more apparent each year; the wild grasses are gradually becoming shorter and thinner, and it is only a question of time when all hay lands will require irrigation to assure a good crop.

Farming operations consist principally in cutting wild hay for feeding purposes. The crop in 1899 was 5,000 tons, being short on account of heavy and continued rains during the haying season, which spoiled large quantities of new-mown hay. On the school farms and some protected tracts they have succeeded in raising vegetables and sometimes wheat and oats in favorable years.

The first issue of stock made to the Blackfeet was in 1890, when they received 850 head; since that time several issues have been made them, and they are beginning to realize the profits from their herds. The stock is issued to the Indians individually, and they are required to care for them, each Indian having his particular brand; in this way better results are obtained than when cattle are owned by the tribe and herded together. They met with severe losses during the blizzards of 1898, when 40 per cent of their

stock perished from a lack of hay and shelter. Better facilities have since been provided, and cattle and ponies are fed at least during a portion of the winter. They sell annually a large amount of beef to the Government. The reports show a large amount of stock owned by white men who have married Indian women, only 15 out of 36 stockmen reporting being Indians. Dairy cows are owned by 8 Indians; a few have also chickens and swine.

Crow Reservation.

The Crow reservation, comprising in 1900 an area of 5,475 square miles, is situated in the extreme southern part of Montana, the state line forming its southern boundary. The climate of this section is subject to long, dry spells, and irrigation is a necessity in order to carry on agriculture successfully. The valleys of the Big Horn and Little Horn contain immense areas of rich agricultural land, upon which an unlimited supply of water is easily conveyed. The range is also of exceptional quality, bench lands affording excellent grazing facilities.

As a tribe, the Crows are peaceable, readily comply with instructions and are inclined to settle down; agriculture, stock raising, work on irrigation ditches, and freighting Government supplies now constitute their general occupations. Agriculture is the principal pursuit, and in it they are making steady progress.

A most important step toward civilization is the irrigation system which, when completed, will enable every family to locate on sufficient agricultural land to support itself in comfort. This system ranks among the finest in the United States, and is also one of the largest and most expensive. The total length of the main ditches is 78 miles, covering approximately 70,000 acres of land.

The Big Horn Canal, now nearing completion, is the most extensive one in the system. Taken from the Big Horn River as it leaves a canyon in the mountains, it has a length of 32 miles, a width of 30 feet on the bottom, and covers approximately 47,000 acres. The headgate is a permanent structure of solid masonry, comparing favorably with any of its kind; the flow through the weir is controlled by five regulating gates of cast iron, which are raised by screws and hand wheels with ball-bearing attachments. Frequent landslides and an excessive inflow into the excavation have made the work on this structure very difficult and expensive. The Fort Smith cut on this canal was also an expensive piece of excavation, extending for three-fourths of a mile and containing 200,000 cubic yards of material, mostly loose rock, cemented gravel, and a strata of shale and solid rock.

Four ditches have been taken from the Little Big Horn River. The Agency ditch, 10 miles in length, covering 5,000 acres; the second, also 10 miles in length, covers 5,000 acres; the third, 8 miles in length, covers 5,000 acres; the fourth, 6 miles in length, covers 3,000 acres. A ditch has also been constructed on Pryor Creek, which waters about 5,000 acres.

All the ditch work of the system is of a most substantial and permanent character. The expense has been borne by the Indians themselves, and is being paid from their annuity funds and money received through grazing leases. The policy of the Government in employing Indian labor has been

of great benefit and advantage to them; besides providing employment it has taught them habits of industry and has also given them a knowledge of irrigation which they could not have acquired in no other way.

The Crows raise wheat, oats, vegetables, and also cut large quantities of wild hay. The results of agricultural operations in 1899 amounted to 70,000 bushels of wheat, 10,000 bushels of oats, 5,145 bushels of vegetables, and 4,000 tons of hay. Farming is carried on by individual allottees, and also on the communal system under the management of the Government farmers; the greater interest taken in individual farms and the better results obtained, make that system preferable, and it will be adopted exclusively when allotments are completed. The communal system takes away all sense of responsibility and individual interest, which are essential elements of success. The abandonment of Fort Custer has cut off a large market for hay and oats, which they formerly supplied. The Indians own a steam-power flouring mill and from their wheat crop produced enough flour during the census year to supply their own needs and sold 450,000 pounds to the Cheyenne Indians, the Government school and agency.

Stock raising is also an industry of considerable importance among this tribe; they have 3,510 range cattle, owned by individuals and in common. Lack of shelter and frequent attacks by wolves during the winter months have checked the increase materially. But 10 dairy cows are owned by the Crows. As at many reservations, the Indian pony is a serious problem. There are 35,000 on the range of all ages and sizes, the larger number of them inbred and worthless. During the census year 12,000 head were disposed of at prices ranging from \$3 to \$10. Their sales of live stock amounted to \$58,750, and in addition the value of meat and other products of animals slaughtered was \$29,775.

Fort Belknap Reservation.

Fort Belknap reservation is situated in Choteau county, in the north central part of Montana, and has an area of 840 square miles. This tract is adapted to stock raising, as the range is ample and well watered. Agriculture, in such an arid region, is practically impossible without irrigation, although but a comparatively small area would be cultivable even with a water supply.

Two tribes are represented here, the Grosventre (a division of the Arapahoe), of Algonquin stock, and the Assiniboin, of Siouan stock, with a total population of 1,312. Little or no farming operations were carried on in 1899, owing to a late, cold spring, which made it impossible to get seed into the ground in time for crops to mature. In favorable seasons oats, wheat, and vegetables are grown, the patches of grain averaging in size from 5 to 10 acres. Some attempts have been made at irrigation, but thus far results have been meager and unsatisfactory. Two small systems now in course of construction will water 8,000 acres, which will at least assure a hay crop sufficient to feed their stock through the winter months. They are fairly well supplied with farming implements and machinery.

Live-stock interests are paramount at Fort Belknap also, and every effort is being put forth to induce the Indians to care for their animals.

Heretofore their cattle have always grazed in common, but this method is being discouraged and small communities are beginning to close herd together in order to prevent losses by straying, which were frequent under the former method of ranging. They own some good horses in addition to the large herds of useless Indian ponies.

Fort Peck Reservation.

Fort Peck reservation, comprising an area of 2,775 square miles, is situated in Valley county in the northeastern part of Montana, the Missouri River forming its southern boundary. This tract is principally a grazing country, well watered and containing an ample supply of timber. Agriculture is very uncertain without irrigation, owing to the light, dry soil and insufficient rainfall. Some of the bottom lands would produce well with irrigation, but, in spite of an abundant water supply, the difficulty of conducting it upon the land is very great.

The reservation is occupied by the Assiniboin and Brule, Santee, Teton, Hunkpapa, and Yanktonai Sioux, all of Siouan stock, having a total population of 1,946.

Farming operations consist principally in cutting wild hay for winter feeding, but the majority of the 113 Indian farmers raised small patches of corn and potatoes, and two reported wheat and oats also. The number of acres devoted to cereals and vegetables by individual farmers was very small, ranging usually from 1 to 5 and never exceeding 10 acres. There is but one irrigation ditch on the reserve; it is taken out of Poplar River and has a length of 7 miles. In favorable seasons the ditch will cover 200 acres of agricultural land and considerable hay land in addition, but in dry seasons it contains no water.

These Indians have considerable live stock, consisting of horses and cattle. In former years the Assiniboin raised sheep, but these have been sold and range cattle substituted. They take good care of their animals and the herds are rapidly increasing; many reported small sales of live stock. The horses owned at Fort Peck are a better grade than the average Indian pony. Dairy cows are found on some of the farms and also chickens.

Flathead Reservation.

Flathead reservation, embracing an area of 2,240 square miles, lies in Flathead and Missoula counties in the western part of Montana. The reservation is naturally divided into four mountain valleys in which the land is well adapted to both agriculture and stock raising. The soil is a sandy loam and somewhat gravelly, but fertile, and with irrigation producing fine crops of grain, fruit, and vegetables. Approximately 500,000 acres are cultivable, of which three-fourths will require irrigation. The mountain streams furnish a never-failing water supply, easily diverted. The ranges are in fair condition, although somewhat overtaxed. Camas Prairie, 8 miles long and 40 miles wide, is a natural meadow. There is also an abundance of timber here for the construction of houses and fences.

Five tribes inhabit this reserve, namely, Flathead, Pend-d'Oreille, Spokane, and Lower Kalispel, all of Salishan stock, and the Kutenai of Kitun-ahan stock, comprising a total population of 2,142. There are 128 Indian

farmers; the area cultivated by individual Indians ranges from 5 to 375 acres, the majority cultivate less than 100 acres.

There is no regular system of irrigation on the reservation. Much of the land now under cultivation lies along the river and creek bottoms, requiring little or no irrigation to grow successful crops, or is land upon which water can be turned with little or no labor where small, individual ditches have been made. The Government has constructed two ditches, one 5 miles long, covering 3,000 acres and the other 2 1-2 miles long covers 2,000 acres. Systematic irrigation is all important at the present time and it is expected that the Government will build additional ditches in the near future in order to provide farms for those who are ready to settle down and till the soil, but who are without suitable land.

Wheat, oats, and hay are the principal crops, some clover, alfalfa, and other tame grasses are also cultivated. There is a flour mill on the reserve, and the wheat raised by the Indians furnishes flour enough for home consumption and also for the demand of traders and neighboring ranchmen. Most farms have small gardens in which are found potatoes, cabbages, onions, and sweet corn, and frequently small fruits. Orchards of bearing apple trees are quite common and a few cherry, plum, and pear trees.

Of equal importance with agriculture are the stock-raising interests which are rapidly increasing. At present the larger number of range cattle are owned by a few Indians and "squaw men," although many Indians have made a small start. The high prices received during 1898 and 1899 have caused unusually large sales and the number of cattle on the range at present is less than in former years. The majority of the Indian farmers reported sales of live stock and animal products, one Indian's sales during 1899 amounting to \$10,100. The larger number of sales was less than \$1,000; but 19 reported sales of \$1,000 or over, and 5 of \$4,000 or over. A large number of farmers own dairy cows and reported milk and butter; chickens and swine are also quite common. A herd of 25 buffaloes and a few sheep and goats constitute further possessions of live stock.

Northern Cheyenne Reservation.

Northern Cheyenne reservation, containing an area of 765 square miles, is located in Rosebud county, in southeastern Montana. Most of the land is hilly and broken, but well adapted to grazing. Large areas of pine timber form a protection to the stock in stormy weather. Only the bottom lands of the four small creeks running through the reserve are suitable for agriculture. Approximately 20,000 acres would be cultivable with sufficient irrigation, but the water supply is very limited.

The Northern Cheyenne of Algonquin stock inhabit this reservation, and number in all 1,454. Together with the Piegan they are the most western tribe of this stock in the United States.

At the time the census was taken, nearly all the available agricultural land was in the hands of a few white settlers, who had taken up claims before the Cheyenne selected this tract as their home. Consequently, the Indians have had little opportunity to advance along agricultural lines. However, seed has been furnished every year, and many have planted small patches

of corn and potatoes, but the drought often destroyed their crops before they matured. Great difficulty has been experienced in inducing some of the Indians to properly care for their gardens, as they plant the seed and simply await results without giving it further attention. Their crops in 1899 were a failure with the exception of wild hay. The white farmers on the reserve have constructed a number of small irrigation ditches, which will water approximately 900 acres. With this irrigation land now in possession of the Indians, they should begin to make material progress in agriculture. The principal crops of the white men were wheat, oats, and wild hay; they also raised a small amount of barley, corn, and alfalfa.

The live stock of the Indians consists of Indian ponies and a few American horses. When they come to realize the relative value of range cattle and ponies, and substitute the former for the useless beasts they now possess, they will have taken a step towards self-support.



BEGINNING OF THE HAYING SEASON.

AN OBJECT LESSON,

It would be utterly impossible to furnish more conclusive support to the statement, heretofore made, that Montana offers unsurpassed opportunities for the agriculturist than is given in the subjoined tables, which show the source and number of pounds of agricultural and dairy products, meats, eggs, and poultry brought into the State for a single year. The figures challenge belief, but yet are correct and authentic, having been taken from the shipping bills in various freight offices. These supplies could and should be raised at home, and in furnishing the vast quantities of produce which are now purchased in other States lies a golden opportunity for thousands of men and women to better their condition in life, as well as improved times for the entire State. To allow present conditions to continue is almost criminal. It is true that most of the produce is what is commonly raised on a "truck farm," and that this is beyond doubt the style of farming that represents a vast amount of hard labor; but is also true that on a five or ten acre irrigated tract the same amount of labor common to the majority of workingmen at their usual avocation would give them far greater returns for the year, as well as more healthful environment for themselves and their families.

In this collection of statistics will be found additional justification also of the contention that intensive methods of farming are necessary to bring Montana to its full agricultural development.

The average citizen must arouse from the apparent hallucination that only those who have millions are able to make money. Nerve and a very small capital will put them in an independent position, and the combined efforts of a comparatively small number of people will rescue the State from its present deplorable dependence upon others for common necessities of life.

It does not take a fortune to establish a small business in these lines, which can be developed in a few years to a much greater extent. All citizens cannot be mining or stock kings, but there is room and opportunity for thousands of independent, prosperous and happy American sovereigns, who, starting in a small way, will aid in bringing to Montana an era of unprecedented success and plenty in which they will be the chief participants.

There is still another side to this momentous problem, for it will not be denied that in a great measure the consumer is blamable for existing conditions, he being the final arbiter who determines both the quality and source of the stock of the retailer. It is clearly the duty of the grower to see that his produce arrives at the market in the very best condition to compete with that of growers in other States, and when he has done this the obligation to support the home industry is transferred to the consumer, and whoever the consumer may be, who fails to demand from the dealer upon all occasions the product of home farms and factories, he is guilty of negligence that goes far towards retarding the interests of the State, as well as being unmindful of his own welfare.

It is gratifying to note the formation of Home Industry Associations in various localities. Every citizen of Montana should support the principles of these organizations whether he is a member or not, and the Business Mens' Associations that make this question a prominent one in their deliberations will have no occasion to bemoan either lack of interest in their meetings or complain of dull trade as individuals.

To much praise cannot be given Mr. Edwards for his painstaking labors, which have resulted in giving such accurate and valuable information upon a subject which appeals so directly to every person who has the welfare of the State at heart, and it is to be hoped that all will accept the lessons the tables teach.

Agricultural Products Imported Into Montana During the Year 1901.

(COMPILED BY MR. C. H. EDWARDS, SECRETARY MONTANA STATE BOARD OF HORTICULTURE.)

STATE	Onions	Cabbage	Potatoes	Totals
California	316,500	1,538,232	2,739,510	
Oregon	176,958	.....	106,200	
Washington	773,847	16,235	929,472	
Idaho .....	.....	216	5,470,293	
Utah	109,056	29,000	190,320	
Colorado	29,000	.....	.....
Wyoming .....	.....	.....	.....
North Dakota	240	456	474,072	
South Dakota .....	.....	.....	.....
Nebraska .....	.....	168	.....
Kansas .....	.....	.....	.....
Minnesota	37,008	60,732	416,160	
Iowa .....	.....	.....	.....
Missouri .....	.....	.....	39,360	
Wisconsin .....	.....	.....	.....
Illinois	33,000	.....	.....
Total	1,475,609	1,645,039	10,374,387	13,495,035

STATE	*Mixed Veg'bles	Celery	Asparagus	Totals
California	1,455,516	1,200	.....
Oregon	9,973	.....	66	
Washington	904,150	10,962	14,944	
Idaho	34,200	.....	60	
Utah	465,032	11,462	4,608	
Colorado	38,512	49,638	.....
Wyoming .....	.....	.....	.....
North Dakota	19,164	.....	.....
South Dakota .....	.....	.....	.....
Nebraska	2,256	305	.....
Kansas .....	.....	.....	.....
Minnesota	47,560	1,004	.....
Iowa .....	.....	.....	.....
Missouri	1,342	300	.....
Wisconsin	96	.....	.....
Illinois .....	.....	.....	.....
Total	2,997,801	74,871	19,678	3,092,350

* Not Classified on Freight Bills.

STATE	Gr. Beans	Gr. Peas	Green Corn	Totals
California				
Oregon	2,736	354	120	
Washington	3,051	9,310	4,230	
Idaho	2,658	942	3,390	
Utah	1,777	857	7,974	
Colorado	864	450	60	
Wyoming				
North Dakota				
South Dakota				
Nebraska				
Kansas				
Minnesota	470	1,200		
Iowa				
Missouri	480			
Wisconsin				
Illinois				
Total	12,036	13,113	15,774	40,923

STATE	Tomatoes	Cucumbers	Lettuce	Totals
California	148,038			
Oregon	1,761	10,655		
Washington	31,742	2,025	3,233	
Idaho	7,992	569		
Utah	116,624	8,532		
Colorado	5,066	144		
Wyoming				
North Dakota				
South Dakota				
Nebraska			160	
Kansas	60	106		
Minnesota	23,164	16,320		
Iowa				
Missouri	129,153	3,180		
Wisconsin	60			
Illinois		864		
Total	463,660	42,395	3,393	509,448

STATE	Spinach	Rhubarb	Squash	Totals
California				
Oregon				
Washington	5,799	40,435	2,236	
Idaho				
Utah	50	1,386	2,490	
Colorado				
Wyoming				
North Dakota				
South Dakota				
Nebraska				
Kansas		264		
Minnesota				
Iowa				
Missouri				
Wisconsin				
Illinois				
Total	5,849	42,085	4,726	52,660

EIGHTH BIENNIAL REPORT OF BUREAU

STATE	Carrots	Beets	H'rse Radish	Totals
California	1,800	1,800	.....
Oregon .....	.....	.....	4,050	
Washington	2,832	870	200	
Idaho	83	.....	.....
Utah .....	.....	.....	.....
Colorado .....	.....	.....	.....
Wyoming .....	.....	.....	.....
North Dakota .....	.....	.....	.....
South Dakota .....	.....	.....	.....
Nebraska .....	.....	.....	60	
Kansas .....	.....	.....	.....
Minnesota .....	.....	.....	120	
Iowa .....	.....	.....	.....
Missouri .....	.....	.....	.....
Wisconsin .....	.....	.....	.....
Illinois .....	.....	.....	.....
Total	4,715	2,670	4,430	11,815

STATE	Turnips	Dried Peas	Dried Beans	Totals
California	12,000	.....	654,464	
Oregon	
Washington	1,276	14,664	76,548	
Idaho	
Utah	
Colorado	
Wyoming	
North Dakota	
South Dakota	
Nebraska	948	
Kansas	
Minnesota	8,544	144,114	
Iowa	
Missouri	
Wisconsin	
Illinois	816	313,580	
Total	13,276	14,024	1,189,654	1,226,954

STATE	Clover Seed	Flax Seed	Millet	Totals
California .....	.....	.....	.....
Oregon .....	.....	.....	.....
Washington .....	.....	.....	.....
Idaho .....	.....	.....	.....
Utah	39,000	.....	.....
Colorado .....	.....	.....	.....
Wyoming .....	.....	.....	.....
North Dakota .....	.....	.....	.....
South Dakota .....	.....	.....	.....
Nebraska .....	.....	.....	.....
Kansas .....	.....	.....	.....
Minnesota	27,336	6,060	25,010	
Iowa .....	.....	.....	.....
Missouri	14,424	.....	.....
Wisconsin .....	.....	.....	.....
Illinois	24,354	.....	.....
Total	105,114	6,060	25,010	136,184

STATE	Alf. Seed	Barley	Oats	Totals
California				
Oregon				
Washington				
Idaho		145,200	49,080	
Utah			82,560	
Colorado	54,446			
Wyoming				
North Dakota				
South Dakota			153,600	
Nebraska				
Kansas				
Minnesota				
Iowa			47,100	
Missouri	29,000			
Wisconsin				
Illinois				
Total	83,446	145,200	332,340	560,986

STATE	Wheat	Malt	Mix'd Pickles	Totals
California				
Oregon		265,332	380,533	
Washington			288	
Idaho	4,471,134	897,768	45,306	
Utah	267,432			
Colorado			92,760	
Wyoming			36,660	
North Dakota				
South Dakota	13,332,584			
Nebraska				
Kansas		60,000	1,206	
Minnesota				
Iowa	168,000	46,440	425,196	
Missouri				
Wisconsin			313,824	
Illinois				
Total	182,391,150	1,269,540	1,429,873	20,988,538

STATE	Ham	Bacon	Cured Meats	Totals
California				
Oregon				
Washington				
Idaho			19,188	
Utah				
Colorado				
Wyoming				
North Dakota			1,536	
South Dakota			2,945	
Nebraska				
Kansas	4,384,694	2,198,352	23,186	
Minnesota				
Iowa	243,979	121,350	123,526	
Missouri	258,624	129,554		
Wisconsin	2,318,584	1,159,281	143,926	
Illinois			150	
Total	7,222,021	3,617,177	552,487	11,391,665

EIGHTH BIENNIAL REPORT OF BUREAU

STATE	Fr'sh Pork	*Fr. Meats	Cond's Milk	Totals
California				
Oregon				
Washington			3,900	
Idaho	2,317,212	37,191		
Utah	164,488	37,778		
Colorado		390		
Wyoming	16,576	1,700		
North Dakota	5,944	54,468		
South Dakota				
Nebraska	56,213	1,923,970	1,880	
Kansas			38,160	
Minnesota	35,694	503,311	74,958	
Iowa		77,600		
Missouri		503,013	328,458	
Wisconsin	1,450			
Illinois			452,629	
Total	2,597,577	3,139,421	899,985	6,636,933

* Fresh Meats.—Other than Pork.

STATE	Butter	Oleo. and Butterine	Cheese	Totals
California				
Oregon	1,194		168	
Washington	3,120		190	
Idaho	35,038		1,974	
Utah	164,221		121,337	
Colorado				
Wyoming	660			
North Dakota	274,398		3,960	
South Dakota	2,640			
Nebraska	1,444,795	93,563	35,419	
Kansas	1,215,500	16,302		
Minnesota	625,123	17,007	305,221	
Iowa	81,462	25,159		
Missouri	172,201	513,297	2,760	
Wisconsin	205,804		132,624	
Illinois	124,800	34,737	147,713	
Total	4,350,956	700,065	751,366	5,802,387

STATE	Eggs*	Poultry	Lard	Totals
California				
Oregon	30,740	356		
Washington	1,500	1,554		
Idaho	219,100	23,638		
Utah	275,280	37,404		
Colorado		14,304		
Wyoming	2,750	600		
North Dakota	73,872	4,820	816	
South Dakota	9,120			
Nebraska	2,741,300	1,402,648	1,132,336	
Kansas	1,735,920	792,337		
Minnesota	496,200	57,364	121,437	
Iowa	344,340		60,438	
Missouri	774,300	689,044	568,651	
Wisconsin	54,360			
Illinois	1,800	768	4,442	
Total	6,760,582	3,024,837	1,888,620	11,674,039
Grand Total				75,569,997

* Eggs—In pounds (4,056,360 Dozen)
Value of Total importations about \$6,500,000.

HORTICULTURE.

The historical records of the State show that as early as 1864 fruit trees had been planted in the Bitter Root Valley, though they did not come into bearing until several years later. These orchards were set out by trappers from the Hudson Bay Company who were attracted by the Mission already many years established by the Jesuit Fathers at Fort Owens. In 1869 there was also a considerable nursery near Helena while in other parts of the state the early settlers had commenced the work of orchard building. From these early beginnings has sprung one of the State's most attractive industries.

Montana apples are a surprise to all who see them and have probably rendered as much service in securing settlers for the state as any other one agency. It is impossible that one should fail to be impressed with a country that produces such magnificent fruit.

For many years Montana was singularly free from any and all the pests which made the raising of perfect fruit so nearly impossible in the Eastern states, and, as the number of trees multiplied and came into bearing, it was boasted that among the thousands of boxes of apples not a single worm-hole or blemish could be found. In time, however, the aphid and other pests made their appearance, brought in either upon the trees purchased from Eastern nurseries which had not been properly treated, or in the boxes or cases in which fruit had been shipped and which, from a mistaken sense of economy, the farmer bought and used again to pack his own fruit. Whatever the source, the evil grew, until conditions became so alarming that the fruit growers united in a demand for remedial legislation which resulted in the passage of the present law providing for the inspection of all trees and fruit shipped into the state, as well as of all the home orchards. The result of this legislation, and the painstaking work of those to whom its enforcement was intrusted, is now very apparent. The destructive enemies of the horticulturalist are rapidly disappearing, and both the quality and quantity of the fruit has been improved.

Every shipment of trees is carefully examined and if found infected in any way it is thoroughly fumigated; and, during the past year, more than 400,000 packages of fruit, averaging 50 pounds each, have been inspected and the infected fruit destroyed. Complete eradication of the causes of wormy and imperfect fruit can only be accomplished through systematic and persistent warfare upon them and the industry of fruit raising has now attained sufficient dimensions to justify every claim for protective legislation that the growers have demanded.

The number of fruit trees in the state is estimated to be not less than 1,650,000, and the principal orchards are located in Ravalli, Missoula, Flathead and Yellowstone counties, although many of the others raise a considerable quantity of fruit. It was thought in the early days of orcharding that it was impossible to mature any but very early apples, and few of the

winter varieties were planted. This resulted in an over supply of early fruit, and low prices in the fall, while it was still necessary to import apples for winter use. In fact, the apple crop came to the market just as berries do—a rush for a short time; then none at all. Experience has shown the fallacy of this idea and the orchards that have been started during later years have contained a greater number of winter varieties while many of the early apple orchards have been cut down.

Montana will be the crab apple orchard of the world.

Nowhere else does this delectable fruit attain such perfection, and it is worthy of mention that the year 1902 witnessed the first foreign trade of Montana apples, five carloads of crab apples having been exported from the Bitter Root Valley to Canada.

It is estimated that the yield of all trees now in bearing is about 25 per cent of the total consumption in the state, and this will rapidly increase as thousands of trees were set out during 1901 and 1902, and other thousands are coming into bearing each year. Generally speaking, two years is the age of most trees when received from the nursery, and an orchard will come into full bearing in from five to seven years after planting. The yield for 1901 is estimated at 175,000 boxes of 50 pounds each, and for 1902 at 300,000 boxes.

Flathead county is estimated to have 150,000 trees. The orchards are principally along the shores of Flathead lake and river, although they may be found scattered throughout the entire valley. They are very successful and the fruit has a wide and well deserved reputation.

Yellowstone county has about 75,000 trees of which probably 40 per cent are in bearing. The fruit of this section is especially fine and has attracted much attention wherever displayed. Many thousands of trees will be planted during 1903, and the industry will be developed in a marked degree. There is a great future for fruit in Yellowstone county.

The greater part of the fruit trees of the State are found in Ravalli and Missoula counties, as well as the oldest orchards. A few miles above Hamilton near Grantsdale, is the orchard of the Bitter Root Orchard Company which contains 49,000 trees, said to be the second largest orchard in the world. These trees were planted in 1895 and are now in bearing. A visit to this beautiful valley during the fruit season is well worth while and will reveal some wonderful sights. It is not uncommon to see very small trees so loaded with fruit that it becomes necessary to prop the limbs or place a tripod of rails over it to which the branches are tied. The yield at times is phenomenal. Near Stevensville one grower picked, packed and shipped 2,800 50-pound boxes of apples from 200 trees. There are many notable orchards in Missoula county and fruit raising on five and ten-acre tracts has become popularized as an employment.

Prices of land suitable for fruit growing vary greatly. Where the land has been purchased by a company, or individual, placed under water, fenced and trees planted, five and ten-acre tracts are sold at from \$100 to \$300 an acre. Some of the old orchards could not be purchased even for the higher figure. There are many cases where a homesteader has planted an orchard.

as soon as he filed on the land, and had it in bearing when he was ready to prove up.

Care should be exercised in the selection of trees so that the losses from unacclimated stock may be minimized, and the most marketable varieties of apples produced. There is a large number of growers who are constantly experimenting and who have young trees to sell in small quantities, but the larger part of the home supply comes from five well equipped nurseries. These are managed by experienced men and their products may be fully depended upon as acclimated and true to name. Patronage of these institutions assists in building up a desirable home industry and the purchaser is assured of stock that is free from disease and imperfections.

In addition to apple growing which is, of course, in the lead, Montana raises all the small fruits in great profusion together with peaches, pears, plums and cherries, and the display at some of the county and fruit fairs



A FLATHEAD COUNTY ORCHARD.

would astonish the Eastern grower. Again, the possibilities of fruit culture are not confined to the western side of the Rocky Mountain range, the success in Yellowstone county proving that it is more neglect than anything else that has retarded the development of this industry throughout the entire State.

Under the direction of the State Board of Horticulture and the fostering care of wise legislation, there is no doubt that the fruit growing area of the State will be largely increased and that in years to come many thousands of people outside the State will enjoy the products of Montana orchards.

Concerning the complaint of certain growers of the low prices for fruit during the present year the statement is made that much of the trouble is due to the methods or rather, lack of method, of packing and shipping.

To remedy this condition many things are necessary, but probably the most important requisite is a thorough understanding of the proper methods of preparing crops for market. Perhaps the most effective way in which

this could be accomplished would be to have the grower follow his consignment to its market destination and there witness for himself the condition in which his shipment arrives. To illustrate the importance of this matter, it is a fact that so soft a fruit as plums is shipped from California to England, arriving in such perfect condition as to shut out the fruit from English trees so effectually that thousands of bushels rotted on the trees while the California fruit met with ready sale at good prices.



SOME OF THE THINGS MONTANA GROWS TO PERFECTION.

The slightest examination at market points of Montana fruits, will convince the most indifferent, that a great improvement can be made and that time and money spent in preparing the packages for market is well invested. There should also be co-operation in the time of marketing. An oversupply of fruit invariably has a depressing effect on prices and a close watch should be kept to avoid overstocking at one time and shortage at another. Careful attention to these and other matters of equal importance will go a long way toward improving conditions for both grower and consumer.

LIVESTOCK.

CATTLE.

The cattle-raising industry did not become firmly established in Montana until it was realized that the herds, under conditions then prevailing, could spend the winters upon the ranges deriving nourishment alone from the grasses that had been cured by nature, and it is accepted as true among the cattle owners of the State that this discovery was made by accident. A freighter, driving bulls from Fort Benton to Helena, was forced by storm to abandon them. In the spring, much to his surprise, he found them alive and in much better condition than in the fall.

The first cattle were brought into the territory in the summer of 1862, when the necessities of the mining camps suggested the business to butchers. They were brought from the south, being driven over great trails that later became famous, and were kept on ranches, in the valleys near the mining camps. Prior to 1870 the cattle in the territory were kept only for home consumption and the increase had been so small that in that year there were only 50,775 head in Montana. Thenceforth, the possibilities of the ranges having been realized, there was a constant increase, but it was not until 1878 that any considerable shipment was made direct from Montana to an eastern market. In October, 1868, D. J. Hogan, now of Augusta, made the first beef drive from the territory, for Orenstein & Popper, of Salt Lake. They were purchased from Ed Creighton and were sold in Salt Lake and along the Union Pacific. In 1874, James Forbes shipped Montana cattle to the east from Ogden; they were purchased out of Conrad Kohr's herd on the range on the south fork of Sun River, but were not classed as Montana cattle on the market. In the early '60's, Tom Moran, Ed Lewis, Jacob Schmidt and others had small bands of cattle in the vicinity of St. Peter's Mission, but they were herded closely.

The range cattle business started in the Sun River valley, into which the first band, 700 head, was brought, in 1871, by Ford and Dunne. The following year O. H. and D. H. Churchill brought 800 head. Until the Northern Pacific entered the State, in 1880, cattle were driven from this section to Granger, on the Union Pacific, 650 miles, or to Pine Bluff, on the Union Pacific, 700 miles; or to Bismark, on the Northern Pacific, 679 miles; or to Fargo, on the Northern Pacific, 800 miles. All drives in those days started from the Sun River valley and on account of the presence of Indians were very dangerous. In 1878 the first "Montana grass westerns" were classified in that way in Chicago. They had been driven from the Sun River and Judith valleys to Bismark, and thence shipped by rail. The returns were so satisfactory that, despite the risk and loss, all began to ship in that way.

In 1882, the first shipment was made from a Montana point—Billings.

Flowerree & Lowry shipped 32 car loads of steers from their Sun River range from that station. In St. Paul two steers were sold for \$100 each, and in Chicago the shipment brought \$84.52 per head, averaging 1,445 pounds. Prior to that time the best beef steers had been selling for \$30 and the news of the Billings shipment attracted to Montana cattlemen from all parts of the United States and many from England. The buffaloes began to disappear and the cattle herds to increase. Transactions involving more than half a million dollars were frequently reported and by 1886 there were 663,716 head in the territory. There was great loss in the winter of 1886-'87, but when the Great Northern opened the northern ranges, in 1888, a revival began.

The ranges in the southern part of the State have been largely taken by sheep and two-thirds of the cattle shipped from Montana last year went from ranges tributary to the Great Northern.

Every year but one, since 1894, cattle from northern Montana have "topped the market."

The vast ranges of Montana form an ideal home for cattle, and this industry was for many years second only to the mines in wealth production. The favorable weather and the high prices for beef have combined to make the past two years very profitable ones for the stockmen. Opinions differ somewhat as to the future of this great industry, depending chiefly upon the point of view; but there is no dissension upon the ultimate change of methods that is impending. The general opinion was very clearly outlined by Governor Joseph K. Toole in his address of welcome to the Pacific Northwest Wool-Growers' Association, which met in the city of Helena on February 5, 1902. In the course of his remarks Governor Toole said:

"Looking backward, we are struck with much ignorance and stupidity of the past. Time was when the old Roman plow and harrow belabored the soil, and cattle were cured or killed by enchantment; when peasants wore charms for the ague; nailed horseshoes on the threshold to keep out witches; carried around in their pockets pieces of a coffin to ward off cramps, and tied red strings around the tails of their new milch cows to prevent the fairies from stealing the butter. In Italy, as we are informed by some reminiscences of travel, it was the custom to break up the land with a root of a tree attached by a grapevine to the cows.

"In my short life I can remember men who would no sooner undertake an important enterprise on Friday than an old Roman general would go into battle 'when the sacred chickens refused to eat their dough;' who never 'looked at the new moon over their left shoulder' without an indefinable apprehension of danger; who would not 'wean a calf when the sign was in the stomach,' or raise a pig whose tail unluckily 'curled to the left.' One class would not plant in the 'dark of the moon,' lest vegetation run to root; another would not plant in the 'light of the moon,' lest it run to top. It is worthy of note that these and many other fallacies have been driven out before the light of discussion, observation and experience.

"If I may be indulged only one other reflection, although disclaiming any profound knowledge, I would say in all soberness and earnestness that the

unquestioned tendency of the times toward large herds, large flocks, large farms, and combinations in general, is not a 'consummation devoutly to be wished.'

"What this country needs, in my humble opinion, is more individualism and less gregariousness; more competition and less of that 'community of interest,' which is struggling for supremacy.

"When this condition shall take the place of the present innovation upon the normal and natural course of affairs in transportation, commerce and other industrial pursuits; when the great Northwest shall have been subdivided into small farms, irrigated and made fertile by waters washed from alluvial soil, and each husbandman shall be the possessor of such horses, cattle and sheep as he can conveniently feed and care for, the aggregate of live stock will far out-number those represented by the immense herds and flocks now owned and controlled by comparatively few persons; money and



OF WHITE FACES OWNED BY THE CATLIN LAND AND LIVE STOCK CO., WHITE SULPHUR SPRINGS.

property will be more equally diffused, and our national greatness will be immeasurably enlarged.

This may be a Utopian dream, full of improbabilities, but however remote the time, and however uncertain its fruition, it ought to be a source of consolation to us, whether fellow citizens in poverty or plenty, to look forward to its expectant coming as the Hebrew, faint with watching in a strange land, looks forward to the coming of the annointed."

This view of the future of cattle growing is shared by the most progressive stockmen of the State. They are emphatic in their assertions that the days of the big cattle companies ranging their stock on public lands, are over, and that the only possible salvation is either in private ownership of large tracts of land, the rapid rise in value of which will require an investment of such enormous capital in land as to make the business unprofitable, or the smaller and more numerous bands of stock owned by the farmer. Such important testimony as that of the late Industrial Commission is also

added to that already cited, the following relating to the subject of beef supply being taken from its report:

"According to some authorities the wool carrier is driving the beef out of Montana, while barbed wire is rapidly narrowing confines, and making the range a fenced country. Many large outfits have forsaken the field entirely, the past season witnessing the clearing up of large bands whose brands will pass into history.

"To those who have been wont to look upon the range country as the source of our beef supply, the present condition of affairs would seem, at first sight, to indicate alarmingly diminished beef stocks, but the shortage is much more apparent than real. The Northwestern country is not the source. It is a sort of reservoir fed from the great springs far to the south, and its supply is drawn toward the market of consumption and distribution when needed. The surplus supply will come henceforth from Texas and the South. The river has changed its course and now empties into the corn lands of Nebraska, Kansas, and Missouri. The past few years have seen an enormous influx of southern cattle into those states, and a plenty of beef is assured for years to come.

"A comparison of the sources of supply of cattle from the several states at Omaha and Kansas City, as primary markets, bears out the view that the live stock industry is being decentralized. With the westward movement of our national capital goes the breeder as well as the feeder. In the valleys of the Mississippi and the Missouri the industry is cradled, while the Southwest is the great propagator and so must the conditions continue. There are our stocks and there is great abundance. The main territorial sources of range cattle are, therefore, the Northwest and the Southwest, with the states between the Rocky Mountains and the Mississippi as stall-fed sources of supply.

"The conditions which surround the production of the live stock of commerce are changing, both in the feed-lot and on the range in all sections of the country devoted to the production, rearing and feeding of cattle. What is meant by the range of to-day and a few years ago is so vastly different that it can be illustrated easily by the citation of the fact that for seasons past the proportion of cattle commonly known as range cattle has been over 75 per cent, while this season 90 per cent of all the cattle has been within easy reach of prepared forage, even on the open range.

"It is apparent that the production of live stock for meat purposes is changing its methods. Pasturage on the ranges figures less and less and stall feeding more and more in the preparation of cattle for the market. This must favor the producer in reducing the rate of mortality among his flocks and herds. But it is still more important as indicating a new stage in productive enterprise. It is, in fact, a transition from the extensive to the intensive system of production. As the ranges are narrowed and put to other uses, our beef will have to be produced within narrower limits. With the extension of beet growing, ranges will be cut up, but the cattle can be fed on beet pulp. With the reclamation of arid lands and the development of irrigation, the alfalfa area will be greatly extended, and that probably most

valuable of all forage grasses will be fed on smaller farms to high bred steers. Other conditions will combine to increase the number of cattle fed on the small farms."

These statements are being verified throughout Montana to-day. The final change will be rapid and complete. In former years of shipment to the eastern market, the only outlet for range beef, it was considered impossible to land cattle there fit for slaughter. But the sale of grass-fed cattle that never had a pound of grain in their lives at unheard of prices during the season of 1902, opens to Montana stockmen who adopt the new method, an era of great prosperity. The interval of feeding between landing and the slaughter pens is no longer necessary. The accumulation of conditions that are now apparently working against the cattle grower can be turned into unadulterated blessings, if the grower will place himself in position to take advantage of them instead of allowing them to overwhelm him in his present business.

The problem is to place the cattle in the hands of the buyer in such condition that they will command the highest prices, and to do this in the face of worn out or diminished ranges while still augmenting the number and value of the herds. The experience of many growers gives warrant for the statement that it is possible as well as profitable to prepare forage for winter feeding. Not only is the percentage of loss from storms and other causes much less, but the prime condition of the stall fed cattle is an added value that can not be overestimated.

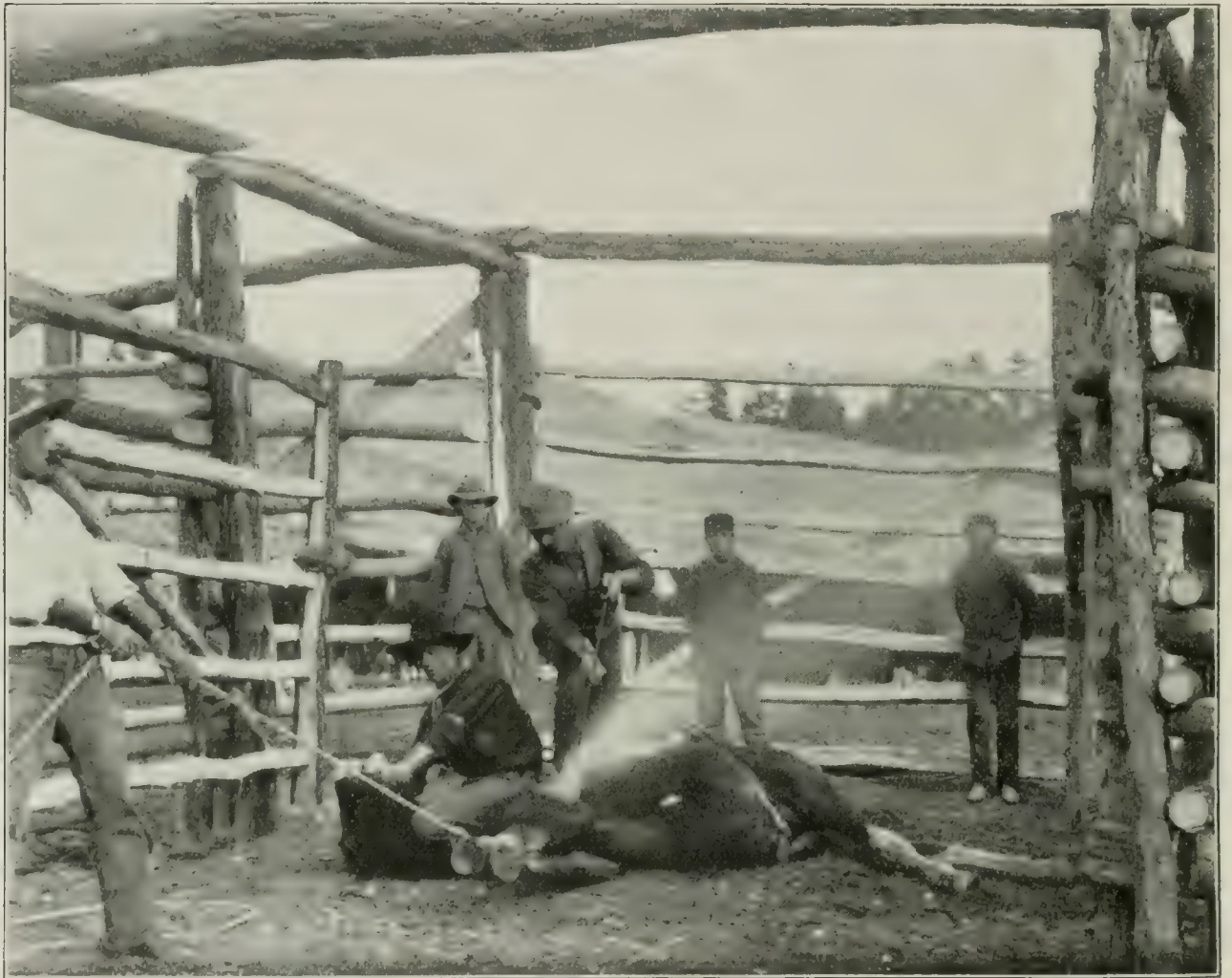
During the winter of 1901-2 many thousands of head of cattle were fed in this State and in every instance there was absolute success. Those stockmen who were fortunate enough to engage in the enterprise give it their unqualified endorsement. The gain in weight brings enough more in price to return to the feeder better values for the fodder consumed than could possibly have been realized had it been sold before feeding.

"The extension of the irrigation system must," as the report says, "increase the number of small ranchers. These will own and feed more or less live stock, and while the great herds may disappear and become a matter of history, the total number of cattle and sheep must inevitably increase until we arrive at the condition of the Eastern states, where there is not, and never has been, the advantages of free ranges," such as we possess.

That such a change will mean loss to the state no one will for a moment contend. The increase of wealth will be so pronounced and general that all will be glad to welcome the new system. While it is not to be expected that all the ranges will be watered by any system of irrigation that may be devised, it does seem that with the enormous sales of State and Railroad lands that are being made, and the increasing number of acres that are each year being put under water, that our stockmen would take this matter seriously and place themselves in a position to take every advantage of the proposed and prospective change in methods. The experiments with various range grasses and forage crops that are now being conducted by the Department of Agriculture and the State Experiment Stations will no doubt afford a satisfactory solution of the question of sufficient fodder for feeding purposes. There

are several of these experiments now under way in different parts of the country, and with different plants that will be watched with great interest. If our ranges and semi-arid lands can be made to grow forage crops that will suffice for winter feeding of stock, and fit them at the same time for the market, it will be of inestimable value to the people of Montana. Our stockmen and farmers should co-operate in this work and definite results should be properly placed before the public in every possible manner.

Too much stress cannot be laid upon the idea that the great need of our State is a change from extensive to intensive methods. It is true that the very vastness of all our surroundings suggests vast enterprises. That the



BRANDING SCENE.

great mountains, plains and rivers; the enormous ore deposits and the universal prodigality of Mother Nature seems to weed out or smother those tendencies to parsimony which are the outgrowth of conditions in so many less favored localities. And so far it has been well. No one would have advocated a policy which would change by a hair's breadth the character of those bluff, big-hearted, sturdy noblemen which Montana's pioneer days produced; nor the wide, free-handed, hearty, hospitable ways that made them the most delightful friends and neighbors. Only men of such character could have prospected a mountain wilderness and developed such a magnificent industry. "But the old order changes." Old-time methods must give way to new conditions. As the "Star of Empire takes its westward way" the things that have charmed in the past must take their place in history,

leaving only their delightful memory. New men and new methods arrive in company to take their places as developers of our commonwealth. And those of us who are the most apt, or the better prepared to take cognizance and advantage of these changing conditions will reap the greatest benefit.

Until the winter of 1886 and 1887 winter feeding of range stock was practically unknown. The severe storms of that period, however, caused such an enormous loss to the stockmen that many were of the opinion that the days of range cattle raising were passed. Thousands and thousands of head of stock perished and many of those engaged in the business were ruined. The lines of the railroads were strewn with dead carcasses, while a large number of herders also lost their lives. It can safely be said that the storing of fodder for winter feeding dates from this time. For, while previous to that disastrous winter a few small growers had cut wild hay for such emergencies, it was not until the following years that any considerable number of them did so. From that time on, however, the practice has grown until at the present time there are few, if any, stock growers who neglect this very important point of their business. The yearly cut of wild hay is enormous. More and more growers each year are substituting cultivated forage crops for the wild hay. The winter feeding, while it has lessened the loss from exposure to bad weather and scant feed, has also had the effect of enabling the grower to improve the breeding of their herds, and thus to realize much greater profits. The falling off in the number of cattle shipped out of the State during the year 1901, as compared with the number shipped in previous years, did not represent any corresponding loss to the stock growers. The increased weights due to proper feeding, and the relatively high prices received, more than offset the loss in numbers, while the mild open winter made the ranges the finest of pasture covered with luxuriant grasses, upon which the great herds wintered in the best of condition. The cattle men are, therefore, contented and happy and look for a continuance of their well merited prosperity.

NUMBER AND VALUE OF CATTLE IN THE STATE.

The number of cattle of all classes in the State as reported for assessment in 1902 was 751,040, and their total value computed at \$17,213,384. They are divided into eight classes for the purpose of assessment, and both in number and value the stock cattle lead, there being 555,383 head with a valuation of \$12,887,070. Yearlings are next in number, there being 74,088 of these with a valuation of \$1,127,476, and following these are the two-year-olds with 56,016 head, valued at \$1,098,614. The others are divided into beef cattle, 24,584; cows, 33,146; three-year-olds, 7,581; thoroughbreds, 110; and bulls, 132.

Every county returns cows and stock cattle, but the great bulk of the herds are reported from the eastern part of the State. Custer county leads with 73,227 head of all classes. Rosebud is second with 65,222; Choteau and Dawson follow with 61,762 and 51,818 respectively. None of the other counties reach 50,000 head. Fergus county has 49,226, Cascade 40,439, Madison 33,359 and Teton 31,524, while Deer Lodge reports the smallest number, 2,443.

The average value of the cattle, including all classes, is \$22.92. Sixty thoroughbreds are reported from Meagher county at \$51.75 a head, and 50 from Powell county at \$50 a head. Cows are assessed at an average of \$30, the highest figure being in Broadwater county at \$35.22, and the lowest in Custer county at \$28.79. Stock cattle range from \$22 in Valley and Gallatin counties, to \$25 in Yellowstone. Beef cattle average through the State \$36.35 with the highest value in Silver Bow county of \$62.85 and the lowest, \$30, in Choteau and Gallatin. Yearlings average \$15.20 a head, with a high valuation in Silver Bow of \$17.21 and the lowest of \$14.90 in Dawson county. Two-year-olds average \$19.60, the highest valuation being \$23 in Park county, and the lowest, \$16, in Rosebud. The value of bulls is reported in Choteau county as \$64; in Park county as \$50, and in Valley county as \$44. One hundred and sixty-four buffaloes are returned for taxation with a valuation of \$39,340. These are the herds in Missoula, Flathead and Cascade counties.

PRICES OF MONTANA RANGE CATTLE IN CHICAGO.

With the exception of the year 1900 the number of cattle received at the Chicago market was less in 1901 than for many years, but the top price was the best for any year since 1884, reaching \$5.75. The season was late in opening; the first cattle arriving August 5, and it was well on toward the first of September before they began moving freely. The better quality of the cattle, due, no doubt, to better methods of feeding, was responsible for the higher prices. The top monthly and yearly averages were higher than for any year since 1895.

WESTERN RANGE CATTLE PRICES, 1901.

	Steers.	Cows.	Feeders.
August	\$3.40@5.05	\$1.85@4.35	
September	3.45@ 5.60	2.50@ 4.75	\$3.80@4.30
October	3.35@ 5.75	2.00@ 4.75	3.35@ 4.25
November	3.35@ 5.45	2.50@ 4.25	3.15@ 4.20

MONTHLY AVERAGE PRICES OF RANGE CATTLE FOR YEARS DESIGNATED.

	1901	1900	1899	1898	1897	1896	1895
July		\$4.45				\$3.50	\$4.25
August	\$4.50	4.40	\$4.65	\$4.30	\$4.00	3.45	4.10
September	4.65	4.40	4.60	4.30	3.85	3.35	3.60
October	4.65	4.25	4.55	4.25	3.80	3.50	3.60
November	4.50	4.25	4.60	4.00	4.00	3.75	3.45
December			4.50	4.00		3.50	3.50

Predictions were freely made during 1901 that the following year would witness an increase in prices, and these were fully justified. The year 1902 was a record breaker for top prices, and fortunate indeed were those whose shipments were first in market, as while prices never became abnormally low there was a large and sudden falling off. On August 13 four Montana steers belonging to Ludwig Lafeldt, averaging 1,740 pounds, were sold at \$7.50 per cwt., or the remarkable price of \$130.50 a head. This is much the highest

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A VIEW OF LEWISTOWN

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price ever paid for western rangers. Earlier in the same month two carloads belonging to the Conrad-Price company were sold at \$7.15. These prices did not prevail long and the top soon dropped to \$5.75, but during the month of November rose again to \$6.50. The year 1902 will long be remembered as the banner year for stockmen.

TABLE SHOWING THE RECEIPTS OF RANGE CATTLE AND PRICES AT CHICAGO, FOR THE PAST TWENTY YEARS.

Year	Receipts	Top prices.	Year	Receipts	Top prices.
1882	218,500.....	\$6.50	1893	314,400.....	4.75
1883	176,500.....	6.25	1894	374,500.....	5.00
1884	231,500.....	6.00	1895	430,500.....	5.10
1885	200,500.....	5.25	1896	271,700.....	4.40
1886	248,500.....	4.60	1897	233,500.....	4.90
1887	261,000.....	4.35	1898	195,500.....	5.00
1888	267,500.....	5.40	1899	183,700.....	5.70
1889	160,000.....	4.10	1900	137,000.....	5.35
1890	229,500.....	4.50	1901	150,000.....	5.75
1891	370,000.....	5.60	1902	300,000 (estimated).....	7.50
1892	271,000.....	4.60			

MOVEMENT OF CATTLE.

The movement of Southern cattle for the year 1902 differed from that of last season in some features. In 1901 the Northwest received many from Kansas City and Omaha, while in 1902 the movement has been mainly from Texas, New Mexico and Arizona. Last year's movement to Montana was; From Texas, 99,408; from Kansas City, 29,511; from Omaha, 4,000; total 132,919.

CATTLE FEEDING.

(From Bulletin No. 35, Montana Experimental Station.)

The objects sought in this work were to determine the relative results from feeding light, medium and heavy grain rations in conjunction with legumes for fattening purposes. Though similar work has been done along these same lines in other portions of the country, still, it was thought best to repeat it here owing to the marked difference in the quality of Montana grown food stuffs. Figures were also sought to support previous assertions of the fact that only a minimum amount of grain is necessary along with our legumes to produce a good quality of beef or mutton.

For the purpose of this experiment 22 two-year-old steers were purchased by Mr. Jos. Kountz. These animals were grades showing Short-horn blood and were growthy but thin and in a condition to put flesh on rapidly as the figures show. They were about the average of range production.

The feeding period was divided into three parts, viz: preliminary, test and final. The preliminary period of 24 days extending from Dec. 9, 1901, to Jan. 3, 1902, was necessary in order to get the animals all under full feed after the operation of dehorning. The trial test proper was a short one extending from Jan. 3 to March 28, a period of 85 days. In the final the animals were merely kept on feed till April 12 when they were disposed of.

The feeding was done in open yards with sheds provided for shelter and with constant access to water. The sheds were used at night almost continually while in the case of the sheep very seldom. In general the weather was a little too mild during the test proper. The yards thawed out nearly every day. The best conditions seem to be when the thermometer does not rise above 32 degrees during the day.

Food Consumed by Three Lots and Cost of Same.

Lot I.—7 Steers.

Clover fed Jan. 2d to Mar. 28th, 11,540 lbs. at \$5 per ton.....	\$28.85
Barley meal fed Jan. 2d to Mar. 28th, 2,975 lbs. at 90c per cwt.....	26.77
Total.....	\$55.62



BRANDING CALVES.

Lot II.—7 Steers.

Clover fed Jan. 2d to Mar. 28th, 11,560 lbs. at \$5 per ton.....	\$28.95
Barley meal fed Jan. 2d to Mar. 28th, 4,008 lbs. at 90c per cwt.....	36.07
Total.....	\$65.02

Lot III.—8 Steers.

Clover fed Jan. 2d to Mar. 28th, 13,500 lbs. at \$5 per ton.....	\$33.75
Barley fed Jan. 2d to Mar. 28th, 6,057 lbs. at 90c per cwt.....	\$54.51
Total.....	\$88.26

The clover hay was fed twice each day in racks so constructed that there was no waste. The barley was ground and the meal fed in flat troughs raised about three feet above the ground.

Average Amount of Food Consumed per Day.

Lot I.	Clover consumed per head per day.....	19.3	lbs.
Lot I.	Barley meal consumed per head per day.....	5.	lbs.
	Total.....	24.3	lbs.
Lot II.	Clover consumed per head per day.....	19.4	lbs.
Lot II.	Barley meal consumed per head per day.....	6.73	lbs.
	Total.....	26.13	lbs.
Lot III.	Clover consumed per head per day.....	19.8	lbs.
Lot III.	Barley meal consumed per head per day.....	8.9	lbs.
	Total.....	28.7	lbs.

Attention is called to the fact that the amounts of clover consumed daily are about the same for the three lots, even though the amount of grain increased from lot I. up. The fact that more food was required even where grain was fed is due to the greater weights of lots II. and III. The division was made on a basis of quality rather than weight. The aim being to have the steers of the different lots as even in quality as possible.

Preliminary Weights and Effect of Dehorning.

22 steers, weight Dec. 9th, 1901, 22,185 lbs., average 1,008.

22 steers, weight Jan. 2d., 1902, 23,170 lbs., average 1,053.

Average gain during period of twenty-four days, 45 lbs.

Gain per head per day during period of 24 days, 1.87 lbs.

Gain per head per day during period of 85 days, 2.27 lbs.

The figures relating to weights secured during the preliminary period show that dehorning had little effect on the steers. The average daily gains are some smaller, which is partly due to the fact that less grain was fed than in the next period. These animals fed heartily immediately after the operation.

Test Weights, for 85-Day Period.

VARIOUS LOTS	Weight January 2, 1902.....	Average	Weight March 28, 1902.....	Average.....	Total Increase	Increase Per Head	Increase Per Day.	Per Cent Increase.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Per Cent
Lot I, 7 Steers	6350	978.5	8240	1177	1390	198.5	2.33	20.2
Lot II, 7 Steers.....	7240	1034.3	8590	1227	1350	192.8	2.26	18.6
Lot III, 8 Steers.....	9080	1135.	10600	1325	1520	190.	2.23	16.7

Food Per Head Per Day Per 100 lbs. Live Weight.

Pen I. Average 1,077 lbs. barley per cwt. .46 lbs. clover 1.79 lbs.

Pen II. Average 1,130 lbs. barley per cwt. .59 lbs. clover 1.71 lbs.

Pen III. Average 1,230 lbs. barley per cwt. .72 lbs. clover 1.61 lbs.

The results indicate that where legumes are used as roughage, not more than one-half pound of meal per 100 lbs. live weight, per day, is necessary to produce satisfactory gains and at the smallest cost. This is true only, however, of perfectly cured and preserved clover and alfalfa, such as are produced in the arid west.

Solid Food Per Pound Increase.

Lot I. Food per pound increase, 10.4 lbs.

Lot II. Food per pound increase, 11.5 lbs

Lot III. Food per pound increase, 12.9 lbs.

Attention is called to the fact that these figures include maintenance during the time each pound was being produced and that owing to differences in live weight these figures would be affected accordingly.

Cost Per Pound Increase.

Pen No. I.	Cost per cwt. increase, \$4.00.
Pen No. II.	Cost per cwt. increase, \$4.81.
Pen No. III.	Cost per cwt. increase, \$5.80.

Financial Statement.

Jan. 2d, 1902—By clover, first period, 14,295 lbs. at \$5 per ton.....	\$ 35.73
Jan. 2d, 1902—By barley, first period, 1,141 lbs. at 90c cwt.....	10.26
Mar. 28, 1902—By clover, test period, 36,600 lbs. at \$5 per ton.....	91.50
Mar. 28, 1902—By barley, test period, 13,040 lbs. at 90c cwt.....	117.35
Apr. 12, 1902—By clover, third period, 6,435 lbs. at \$5 per ton....	16.08
Apr. 12, 1902—By barley, third period, 2,267 lbs. at 90c cwt.....	20.40
Dec. 9, 1901—By 20 steers, at \$33.00 per head.....	660.00
Dec. 9, 1901—By 2 steers, at \$34.00 per head.....	68.00
Apr. 15, 1902—By net profit on 22 steers.....	168.00
	<hr/>
	\$1,188.00
Apr. 15, 1902, To 22 steers at \$54.00 per head.....	\$1,188.00
Net profit per head.....	7.66

This sum does not represent the complete profit from each animal as the food is charged up at local market prices and is much above cost.

Conclusions.

(1.) Because of the quality of Montana grown food products and the favorable climatic conditions during the winter feeding period, maximum returns can be secured from a minimum amount of food.

(2.) That in fattening steers, when alfalfa and clover are used, not more than one-half pound of grain to the hundred weight of live weight is necessary to produce the most satisfactory results.

(3.) Contrary to local impressions, some grain must be used throughout a period not less than one hundred and twenty days in order to get a good finish.

KAFFIR CORN POISONING OF LIVE STOCK.

As Kaffir corn will grow without irrigation it is likely to receive some considerable attention as a stock food in Montana, as it has in other western States, particularly from cattle owners. It has been ascertained in Colorado and Nebraska, however, that under certain conditions Kaffir corn is extremely poisonous and, therefore, a dangerous food. The following is a case in point which recently occurred in Colorado: A widow, learning that this corn would grow without irrigation, procured twenty cents worth of the seed and sowed it on a small area of land. The plant grew, but in consequence of exceptional drouth during the summer it was stunted, not growing above a foot in height. One morning she had cows turned into the field to graze and, naturally, they went directly for the green patch and began eating the plant ravenously. There were 32 cows in the bunch and within ten minutes after they had begun browsing on the Kaffir corn 25 of them became violently sick and within the next ten minutes the first cow was dead. An effort was made to drive the remainder of them into the barn, but they were too sick to be

driven and inside of an hour after the first symptoms appeared 23 of them were dead. Two that were poisoned recovered.

The facts of this case were called to the attention of Dr. George H. Glover, the head of the Veterinary Department of the Colorado Agricultural College.

Professor S. Avery, chemist of the Nebraska Experiment Station, in



STARTING ON THE ROUNDUP.

response to Dr. Glover's request, ascertained that the Kaffir corn poison consists of prussic acid. A quantity of Kaffir corn from the fatal field near Brighton was analyzed by Professor Avery and the above fact ascertained. A quantity of this grain was experimentally fed to a cow at the college farm after being cut and cured, and gave no detrimental effect. However, it is regarded as extremely dangerous to permit cattle or sheep to graze upon this food stuff or to be fed with it until after it is perfectly cured.

The symptoms, as related by Professor Avery and Dr. Glover, are said to be typical of those of prussic acid poisoning. Professor Avery claims to have found very large quantities of prussic acid in the uncured grain. He also stated that the conditions favorable to Kaffir corn poisoning were that the plant must be green when eaten and stunted in growth, and that the cattle most likely to be affected are underfed cattle feeding on this product on an empty stomach. It is said by the above mentioned authorities that Kaffir corn is absolutely harmless after being perfectly cured.

VACCINATION AGAINST BLACKLEG.

Vaccination against blackleg in Montana was first advocated by the present veterinarian, Dr. M. E. Knowles, in 1897. Up to this time the cattle interests of this State were not familiar with the procedure, and, so far as it is possible to ascertain not a single animal had been vaccinated against this disease. By an active campaign of education relative to vaccination and its benefits, the distribution of vaccine has increased from twenty doses in 1897 to over one hundred thousand doses per annum. The vaccine for free distribution is procured by the State Veterinary Surgeon from the United States Department of Agriculture at Washington, and is furnished



HERD POLLED DURHAM COWS, CLOVER LEAF DAIRY FARM, GALLATIN COUNTY.

to all citizens of Montana engaged in the cattle business free of charge. Any cattleman not familiar with the method of obtaining vaccine should know that all that is necessary is to make application to the State Veterinarian for the vaccine. If the vaccine is wanted urgently it can be secured by a telegram, the vaccine being sent immediately upon receipt of the application. Cattlemen vaccinating every year should make the regular form of application by mail.

The outfit for vaccinating costs from three to six dollars, and can be obtained from any first-class wholesale drug house. The preferable syringe for vaccinating is the solid metal, expanding metal plunger, which is the most expensive, but in the long run is the cheapest as it is practicably indestructible.

CATTLE DIPS AND CATTLE DIPPING.

During the past five years it has been found necessary by the State Veterinary Department to dip quite large numbers of cattle throughout some portions of the State for cattle scab, also designated cattle itch and Texas itch. In this dipping the most satisfactory dips to be used were found to be lime and sulphur and tobacco and sulphur.

Lime and Sulphur Dip.

In making this dip eight pounds of lime and twenty-four pounds of sulphur are required for each 100 gallons of water. This mixture should be prepared as follows: Place the lime in a suitable mixing box, spreading it evenly over the bottom. Then in a barrel, or another box, mix the sulphur with sufficient water to make a pasty soft mass. Now spread the sulphur in its wet condition evenly over the lime in the mixing box and add enough additional water to slack the lime thoroughly, so that you will get the advantage of the chemical action of the slacking lime on the sulphur. After the lime is thoroughly slacked, take a hoe or shovel and mix thoroughly together; then add to the water in the boiling tank and boil for fully three hours. After boiling, allow to settle for an hour or so and then draw off into the dipping vat.

Tobacco and Sulphur Dip.

Tobacco dips should also contain five-hundredths of one per cent of nicotine, and as nicotine is very volatile and much of its strength likely to be lost in alkaline waters, it is necessary, before mixing any tobacco preparation with alkaline water, to add to each 100 gallons of dip one pound of concentrated lye. It is always more satisfactory, and gives better results also to make the tobacco solution about double the strength recommended by the manufacturers. Keeping this fact in mind, there should also be added to each 100 gallons of tobacco dip sixteen pounds of sulphur, which is preferably first mixed with water in a mixing box or barrel and then added to the dip already prepared in the vat. For instance, in using Blackleaf Dip, add first a pound of concentrated lye to each 100 gallons of water in the dipping vat; then make the Blackleaf fifty to one instead of 100 to 1, as recommended by the manufacturers, subsequently adding the sixteen pounds of sulphur to each 100 gallons of dip. Tobacco dip should never be boiled. Simply add the tobacco preparation to the water, always keeping the dip at a temperature of from 110 to 120 degrees Fahrenheit. During the dipping dairy thermometers should constantly be used in the dipping vat at both ends to see that the temperature is kept pretty steadily at from 110 to 116 degrees Fahrenheit for cattle. For sheep, from 110 to 120 degrees Fahrenheit. This will apply to all dips used.

The best results in dipping for scab among cattle are obtained by dipping twice at an interval of six to ten days. Aside from curing scab, the dipping of cattle in the summer time, when insects are bad, has been found to be a most profitable procedure, as, after dipping, flies, mosquitoes and other insects will leave the cattle severely alone for from ten to twenty days. They will, therefore, graze quietly, not being disturbed by these pests, and will, of course, take on more flesh and thrive much more rapidly than when disturbed constantly by animal pests. Cattle scab is much more easily treated than that of sheep, frequently one dipping of lime and sulphur sufficing to bring about a cure.

Dipping Plants.

The plants for dipping cattle will vary in cost according to their size. The requisites are yards in which the cattle are placed while the dip is

being prepared, from which a chute leads to the tank, with suitable fences and walks, and with a sharp incline into the tank which holds the dip. Dripping pens, with inclined floors, are at the further end of the tank, with gates so arranged as to allow a continuous stream of animals through. Opposite the tank is located the boiler house and a suitable place for preparing the solution, with pumps and caloric transfers. The necessary appliances for this building are a 25-horse-power boiler, with injector, a No. 6 Crescent ejector with capacity of 3,500 gallons an hour, 4 caloric transfers and about 300 feet of pipe of various sizes. The total cost of these is about \$600.00.

BRANDS.

The recording of live stock brands was begun in Montana in the year 1871, when it was made the duty of the Clerk of the Territorial Supreme Court. Mr. James R. Alden was then clerk, and he had the distinction of beginning this record, which means so much for the protection of the valuable stock interests of the State. He would make up several pages of recorded marks and brands, and the Chief Justice and one of the Associate Justices would sign it, just as the record of the Supreme Court is signed now. In 1877 the duty was changed to the State Treasurer, who continued the work until 1887, when the law creating the office of State Recorder of Marks and Brands was passed. Mr. Russell B. Harrison was the first incumbent of the new office by virtue of being the Secretary of the Stockgrowers' Association. He was succeeded in 1891 by Mr. W. G. Preuitt, the present incumbent. During the winter of 1891-2 this gentleman commenced the transfer of all brands to a complete new set of books, which involved the labor of transcribing 19,000 different brands. In the books are registered the date of the adoption and recording of the brand, together with the name of the owner and the location of his range. At the left-hand side of the page the brand itself is drawn in red ink, exactly as it appears upon the animal.

Harmless Branding of Hides.

Great complaint has for years arisen against the reckless use of the branding iron on range cattle. Humanitarians have cried out against the inhumanity of this torture by fire, and the utilitarian protest has been lodged that it damages by thousands of dollars the value of the hides from cattle thus branded. It finally came to pass that some of the owners were not content until they had plastered huge brands on the sides of their cattle so that they could be easily read rods away by wild-eyed cowboys on galloping bronchos. The convenience of a large and staring brand is conceded, but it is not worth the cost when the hide comes to be "docked" on account of the leather ruined by the branding iron. The question has engaged the closest attention of thoughtful ranchmen, who endeavor to conserve the profits in the business, but a satisfactory solution has not been reached except that some have resorted to smaller and lighter brands and have burned them on where they will do the least injury to the hide.

A New Zealand method of branding has recently been made public in

this country. Satisfactory tests have been made of a branding composition which is applied with the ordinary iron and leaves its mark sufficiently for all purposes of identification and durability. The composition consists of equal parts of barium sulphide and of coal tar, preferably thinned by a mixture of American potash and water in equal parts by measure, and of spirits of turpentine, each equal in measure to the original composition. Sulphides of the alkalis or alkaline earths are often substituted for the barium sulphide. The account from which we quote states that the liquid resulting from this mixture is applied to the hair or wool and brands the hide "in a substantially permanent and conspicuous manner," and that without injury to the hide. The testimony is unqualified and the idea is certainly worthy of a careful test on our ranges. Leather men will hail the day when disfiguring brands will no longer cause the hides to cut to waste, and it will be money saved on all hands if this New Zealand fashion of branding can be successfully introduced on our western ranges.



COWBOYS AT MESS.

HORSES.

A combination of causes has brought about some very material changes in conditions in the horse business in Montana during recent years. So desperate had the owners of horses become in some parts of the State, a few years ago, that it was not at all uncommon for ranchers to shoot their work horses in the fall, as it was cheaper to buy a new team in the spring than to winter the old one. No attention was paid to range horses, and the result was that a large number died. Shortly there came a revival in the market, caused first by the demands of the government buyers for the Spanish-American war, and later, by those of the English government for use in South Africa. Prices on all classes of horses immediately advanced, and the farms and ranges were searched for available animals.

Attention was again directed to the business of raising horses for the market, and new stock was brought from the east to improve the range and common breeds. The result is that while the number of range and common horses is not so great as in 1900, the valuation has increased, and the growers are much encouraged. At a recent sale the prices were considered good for the quality of stock offered, and hundreds of horses changed hands. Prices for ponies ranged from \$5 to \$25 each. For work horses from \$35 to \$150 a head, while range horses sold from \$17 up, \$50 or \$60 buying a very fair animal. Saddle horses brought from \$20 up.

The returns to the Board of Equilization show that there are 188,621 horses in the State, of which 1,561 are returned as thoroughbreds, having a value of \$141,215. 121,640 are returned as range horses, and their value is given as \$1,994,195; while the number of common horses is 65,420, valued at \$2,237,921. Two jacks are reported from Powell county, with a valuation of \$130 each.

The total assessed value of all horses in the State is \$4,373,591.

Every county in the State reports thoroughbred horses except Rosebud, Madison county having the largest number, 521, valued at \$38,100, or \$73.45 each. Gallatin is next with 205, head, valued at \$14,400, or \$70.00 each. None of the other counties report 100 head, the lowest being Teton county with 3, valued at \$400.00 each, which is the highest valuation reported. The nearest to one hundred is Custer county, with 99 head, valued at \$12,675. The lowest valuation is in Valley county, which reports 27 head at \$63. All counties show a material increase of thoroughbred stock except Ravalli, where the number reported dropped from 225 in 1900 to 49 in 1902. The reason for this was the sale of all horses on the great ranch of the late Marcus Daly at Hamilton.

Of the range and common horses, the largest number, 18,269, is reported from Custer county, and the lowest from Deer Lodge county, 1,747. The average value of range horses is \$16.40, and that of common horses is \$34.40.

SWINE.

The chief reason for the very common neglect shown the important business of growing hogs to supply the needs of the people of Montana is probably found in the fact that so many farmers held to the belief that corn was necessary to their growth and fattening. It is significant for the future of this great industry that this erroneous idea has been partially, if not wholly, removed, and that each year more attention is being given both to quantity and quality in the herds. The large demands, the ease with which the necessary food can be raised, the prolific nature and the rapid maturity of marketable animals, as well as the profits to be derived, all demonstrate the wisdom and advisability of extending this branch of industry.

In places where a stand of alfalfa can be obtained, it affords a summer pasturage for hogs that cannot be excelled and, cut and steamed, it can be fed exclusively in winter. Mixed with ground barley or peas, it will produce the finest kind of pork, and will thus dispose of the farm produce at a much higher price than if it were sold without feeding.

In one experiment reported by Mr. Chas. B. Anderson, of Bozeman, 125 head of hogs were fed on frozen barley for an average period of about 16 weeks, with a resultant profit of \$309.49, or a return for the damaged barley of \$1.02 per cwt. Other tests have shown similarly satisfying results, especially where sugar beets were added to the rations. The beets can be fed whole and raw, but should only form a portion of the food while fattening, the balance of the ration being made up of grain.

In the 12th census the number of hogs in the State on June 1, 1900, is given as 49,496, with an average value of \$4.26 a head for the entire western division, not including Alaska and Hawaii; and, as a reason for this comparatively high value, it is stated that this price represents what the animal was worth to the consumer without the intervention of any middleman or butcher.

Origin of Breeds in the United States.

The swine introduced into the United States by the early colonists were of inferior stock, and the improvement in breed is the result of careful selection, breeding and feeding in comparatively recent years. Size was formerly the chief aim of breeders, and was insisted upon regardless of proportions, per cent of offal or cost of production.

Between 1818 and 1830 the Chester White was evolved as a distinct breed by the crossing of some large white stock from Bedfordshire, England, with the white hogs then common in Chester county, Pa. The Berkshire was introduced from England about 1830, but did not come into general favor until the decade 1870 to 1880. The Poland China originated in southwestern Ohio between 1838 and 1840, from the crossing of various minor breeds. It was known by many names, from among which, in 1872, that of "Poland-China" was selected by the National Convention of Swine Breeders. This breed was crossed with the Berkshire, resulting in better form and

fattening qualities, and in establishing the black color with white markings. The interest in swine breeding in recent years is illustrated by the dates of first registration by the different swine breeders' associations, which were as follows:

American Berkshire, 1875; Standard Poland-China, 1877; Central Poland-China, 1879; American Chester White, 1884; American Essex, 1887; American Duroc-Jersey, 1890, and Standard Chester White, 1890.

In the State the total number of hogs reported for assessment is 11,594, with a total value of \$60,728. These are distributed through every county in the State except Dawson, where none are reported. Gallatin county leads in numbers, having 1,562, with a valuation of \$7,815. Ravalli county is next with 1,492, valued at \$7,460, and Flathead follows with 1,288, valued at \$6,440. None of the other counties report as many as 1,000 head, and range from Custer county with 10, valued at \$50, to Madison county with 987, with a valuation of \$5,960. Value per head ranges from \$5, which is common to 19 counties, to \$7.50 for Silver Bow county. The average value for the State is \$5.07.



SWINE HERD ON GRASSLAND FARM, SHOWING MR. SPRING'S 275 THOROUGH-BRED POLAND CHINAS, GALLATIN COUNTY.

SOME STOCK LAWS.

Reservoirs.

The stockmen in various parts of the State have combined to take advantage of a law passed by the Legislature of 1897, permitting them to take up land for the express purpose of constructing reservoirs for watering range stock. In order that the intended filer may take advantage of the provisions of the act he must make oath setting forth that the proposed reservoir is for the purpose of watering live stock and for no other. He must also give his postoffice address, the county in which the reservoir is to be located; a description of the land by the smallest legal subdivision, 40-acre tracts, or lots, the land under no condition to exceed 160 acres. He must also make affidavit that the land is not occupied or otherwise claimed, and that to the best of his knowledge and belief it is not mineral or otherwise reserved. In addition to all this he must give the business in which he is engaged, including a full and minute statement of the extent to which he is engaged in breeding grazing, driving or transporting live stock, giving the number and kinds of such stock, the place where they are being bred or grazed, and whether within an enclosure or upon unclosed lands.

Such reservoirs may not be enclosed by fences or in any manner shut off, but must be kept open at all times and free for the use of anybody desiring to water animals of any kind.

In November, 1902, nearly 40,000 acres of reservoir holdings were ordered to be returned to the public domain, owing to the fact that the locators had not complied with the requirements of the law.

Estrays.

An estray is defined in the range States as a domesticated animal of commercial value, found wandering from its owner. No individual has the right to take up and detain a domestic animal, unless it be to save it from perishing, or unless it breaks into a lawful inclosure—that is to say, an inclosure surrounded by a lawful fence, or unless there is good reason for the belief that the animal is lost from its owner.

The Montana Codes provide that "If any person * * * save any domestic animal from drowning or from starving when such property is the value of \$10, or more, he must inform the owner thereof, if known, and make restitution without compensation further than a reasonable charge for saving and taking care thereof;" but if the owner of the animal is not known, the detainer must go before a justice of the peace within five days and make affidavit to all facts. Appraisers are appointed, and the justice files a copy of the appraisement with the county clerk. If the property is worth over \$20 the finder must also have a description of the property published. After the lapse of a certain time the property vests in the detainer. Or, if the owner appears he must pay all reasonable charge. And the codes further provide that if the above procedure is not substantially followed the detainer of such property is liable in damages to the owner in twice the value of

the property found; or, if the detainer appropriates the property to his own use without attempting to discover the owner by reasonable efforts, he is guilty of larceny and is subject to punishment accordingly.

The above is the proper course to pursue when stock is taken up to prevent it perishing, but there is also a simpler course to pursue when there is good reason to believe that the animal taken up is lost from its owner—is an estray. In such a case all that is necessary is to make reasonable search and inquiry for the owner, and when the charges of keeping, etc., amount to two-thirds of the value of the animal, publish a notice stating the time and place of sale, and sell the estray to the highest bidder.

And thirdly, if any animal breaks into an inclosure surrounded by a lawful fence, the party injured can distrain the said stock until all damages and reasonable keeping charges are paid by the owner of the distrained stock, and may be enforced the same as the last instance above.

Stock Killed by Trains.

In order to facilitate settlements between the railroads and the owners of stock killed by trains, a schedule of values has been arranged, generally through the officers of the various live stock associations. Throughout Montana these prices have been fixed approximately as below, though they may vary somewhat in different localities, or in special cases:

Steers, fours and up, \$45; steers, three years old, \$40; steers, two years old, \$30; yearlings, 22.50; cows, \$30; yearling heifers, \$20; bulls, all classes, \$50, and calves, \$15.

SHEEP AND WOOL.

The early Montana pioneers found the native Rocky Mountain sheep, but all efforts at domestication and crossing with domesticated sheep proved unsuccessful. The number of sheep in the State was first given in the census of 1870 as 2,024. Ten years later the number had increased to 279,277, while in 1890, 2,352,886 were reported.

The whole number of sheep in Montana, as returned for assessment, is 4,719,610, with a valuation of \$10,869,886. These are classified as stock sheep, lambs and rams, and the number of stock sheep is given as 4,103,318, valued at \$9,516,144, an average of \$2.32 each.

The number of lambs is 585,627, valued at \$1,196,175, an average of \$2.04 each; and there are 30,665 rams, valued at \$157,567, an average of \$5.15 each. Stock sheep are returned from every county in the State, Fergus being in the lead with 681,646. Choteau county is next with 652,524. Eight counties return more than 200,000 head and Flathead county has the smallest number, 565.

Jefferson county has the highest valuation per head, \$3, while Choteau, Fergus and Valley are the lowest at \$2.25 per head.

These sheep are principally on the ranges in charge of herders, and divided into bands that number about 3,000 head each.

As in the cattle industry, the growing scarcity of public ranges is rapidly forcing a change of methods, and feeding is much more common than formerly.

In the production of wool Montana stands first of all the states in the Union. From small beginnings, through many vicissitudes and varying fortune, her flocks have attained this enviable distinction, and their fleece is now a factor in the wool production of the world. The early history of the industry began with the advent of civilization into the State. Through all the trials and privations of early years, with their fluctuations of success and failure, there were those who persevered in their efforts to advance the interests of the State and to extend the boundaries of the live stock industry. To them more than to others is due Montana's proud position as a wool producer.

It was in the '60's that the first sheep were brought into the State from California—mostly Merinos—and in a few years these had increased to many thousands.

In 1879 Senator Gibson became interested in sheep growing, and he soon decided that while the Merino was a good breed, it could and should be improved. He, therefore, bought in the East, and imported a number of Delaine sheep, which he crossed with the Merinos, with wonderful success, and this cross-breed forms the principal part of all the flocks in the northern part of the State, and nearly all the balance are Merinos.

The wool market in early days was a primitive affair at Fort Benton, where all the wool was assembled for shipment on the river, and this con-

tinued until the advent of the railroads, when the principal market for the wools of Northern Montana was transferred to Great Falls. The cities and towns where wool markets are maintained at present and which attract eastern buyers are: Billings, Miles City, Big Timber, Glendive, Great Falls, Fort Benton, Chinook, Terry, Dillon, Big Sandy, Harlem, Havre and Missoula.

The total production of the State for 1901 was given as 30,553,990 pounds of unwashed wool, which was sold at about an average price of 14 cents, and produced, when scoured, 11,304,976 pounds of clean wool, the shrinkage being 63 per cent. For 1902 the crop was estimated to be 35,567,000 pounds of unwashed wool, which sold for prices ranging from 10 to 17 cents a pound, averaging about 14 cents, or a total of \$4,979,380. The Annual Wool Review estimates the number of sheep in the State as 5,081,000, or 361,390 more than the returns of the assessors, but this apparent discrepancy is fully explained by the fact that the assessors do not return any sheep from the various Indian reservations. The shrinkage in scouring is given for 1902 as 63 per cent, leaving 13,159,790 pounds of scoured wool, worth 47 cents a pound, or \$6,185,100, showing a loss in values to the State of \$1,205,720, equal to more than 11 per cent on the total value of all the flocks.

Through the courtesy of the traffic departments of the four interstate railway lines leading out of Montana, the Bureau is enabled to give approximate figures of the wool shipped out of the State during the season of 1902. According to the estimates of these railroad officers the total amount thus transported amounts to 40,340,296 pounds. So far as can be learned from general inquiry there was no wool held over from either the years 1901 or 1902. If there was any it must have been an insignificant amount, and it is believed that this factor in the computation would not reduce the estimates submitted by the railroad companies 300,000 pounds. It may be said, however, that the estimate of shipments out of the State indicates a production greater by some 5,000,000 pounds than has been estimated by any Montana authority. At the same time it is apparent that the railroads are in position to give a closer estimate upon this item than any wool authority in the State.

(At the moment of sending this report to press information is received which confirms the railroad estimates of wool production. There are, perhaps, 300,000 pounds of Wyoming wool which finds its way to Montana railroad stations for shipment. So far as can be learned the former estimate stands as to the amount of wool produced in 1901 and held until 1902 for shipment, and that produced in 1902 and yet remaining in the State to be shipped in 1903. Also, it may be noted that the average fleece per sheep is generally estimated at seven pounds in Montana, whereas the Bureau has reliable statistics which raises this item to 7.75 pounds. Upon this basis of calculation it would appear that the total number of sheep in the State is at least 5,127,781.)

In 1901 there was considerable dissatisfaction among the growers who did not sell in the home market, but consigned their wool to eastern commission houses, with the result that in 1902 but little wool was consigned, the growers preferring to deal directly with the buyers, a course which seems



HAULING WOOL TO THE RAILROAD



A FREIGHTER'S OUTFIT

to be fully justified. It is clearly evident that some change in the system of marketing wool is impending as, under present conditions, without proper arrangements to hold the crops, and the price being fixed by the rates prevailing in the Boston markets, the growers are completely at the mercy of the buyers. It is impossible at this time to refrain from calling attention again to the terrific loss to the State occasioned by shipping wool in the



HERDER, HIS FLOCKS AND HIS DOGS.

grease and dirt, which loss can only be averted by a decided change in methods, and which is at once apparent in a comparison of the price obtained by the grower and the prices in Boston a few days later for the same fleece scoured.

In the Annual Wool Review for 1902 the whole number of sheep in the United States, exclusive of lambs under one year old, is estimated to be 42,184,122, and the total production of wool is placed at 316,341,032 pounds, the flocks and production of each state being shown in the table.

TABLE SHOWING THE NUMBER OF SHEEP, AND THE AMOUNT AND YEAR

STATES AND TERRITORIES	Quality	Number of Sheep, 1902.	Av. Weight of Fleece, 1902.
			lbs.
Maine	Medium	239,972	6.
New Hampshire	¼ fine, ¾ medium	63,000	6.50
Vermont	¼ fine, ¾ medium	160,000	6.75
Massachusetts	Medium	33,000	6.
Rhode Island	Medium	6,500	5.50
Connecticut	Medium	34,000	5.50
New York	½ fine, ½ medium	950,000	6.
New Jersey	Medium	32,000	5.
Pennsylvania	40 per ct. fine, 60 per ct. med.	960,000	6.
Delaware	Medium	6,500	6.
Maryland.....	Medium	112,000	5.
West Virginia	¾ fine, ¼ medium	544,400	5.50
Kentucky	Medium	700,000	5.
Ohio	40 per ct. fine, 60 per ct. med.	2,550,000	5.50
Michigan	½ fine, ½ medium	1,600,000	6.50
Indiana	15 per ct. fine, 85 per ct. med.	960,000	6.50
Illinois	½ fine, ½ medium	625,000	7.
Wisconsin	10 per ct. fine, 90 per ct. med.	945,000	6.50
Minnesota	20 per ct. fine, 80 per ct. med.	350,000	7.
Iowa	½ fine, ½ medium	640,000	6.50
Missouri	¼ fine, ¾ medium	595,000	6.50
		12,104,372	6.09
Virginia	Medium	380,000	4.50
North Carolina.....	Medium	205,000	4.25
South Carolina	Medium	50,000	4.25
Georgia	Medium	250,000	4.
Florida	Medium	100,000	4.
Alabama	Medium	225,000	4.
Mississippi	Medium	230,000	4.50
Louisiana	Medium	155,000	4.
Arkansas	Medium	160,000	4.50
Tennessee	Medium	300,000	4.25
		2,055,000	4.25
Kansas	Fine, fine med., and medium	160,000	8.
Nebraska	Fine, fine med., and medium	330,000	8.
South Dakota	Fine, fine med., and medium	507,000	6.50
North Dakota	Fine, fine med., and medium	450,000	6.50
Montana	Fine, fine med., and medium	5,081,000	7.
Wyoming	Fine, fine med., and medium	4,614,750	7.50
Idaho	Fine, fine med., and medium	2,500,000	7.25
Washington	Fine, fine med., and medium	560,000	8.50
Oregon	Fine, fine med., and medium	2,000,000	8.50
California	½ fall, ½ spring	1,725,000	7.25
Nevada	Fine, fine med., and medium	568,000	7.25
Utah.....	Fine, fine med., and medium	2,600,000	6.50
Colorado	Fine, fine med., and medium	1,400,000	6.50
Arizona	Fine, fine med., and medium	669,000	7.50
New Mexico	Fine, fine med., and medium	3,360,000	4.25
Texas	¼ fall, ¾ spring	1,440,000	6.50
Oklahoma and Indian Territory	Fine and fine medium	60,000	6.50
		28,024,750	6.85
Total, Fleece Wool		42,184,122	6.50
Pulled Wool			
Total Product, 1902			

VALUE OF THE WOOL PRODUCT OF THE UNITED STATES FOR THE 1902.

Per Cent of Shrinkage, 1902.....	Wool Washed and Unwashed.....	Wool Scoured.....	Av. Value Per Scoured Pound October 1		Total Value, 1902.....	STATES AND TERRITORIES
			1901	1902		
	Pounds.	Pounds.	Cts.	Cts.		
40	1,439,832	863,899	35	38	\$328,282	Maine.
55	409,500	184,275	42½	41	75,523	New Hampshire.
56	1,080,000	475,200	42½	41	194,832	Vermont.
48	198,000	102,960	38¾	38	39,125	Masachusetts.
42	35,750	20,735	35	38	7,879	Rhode Island.
41	187,000	110,330	35	38	41,925	Connecticut.
50	5,700,000	2,850,000	40	43	1,225,500	New York.
47	160,000	84,800	35	38	32,224	New Jersey.
52	5,760,000	2,764,800	41⅔	48	1,327,104	Pennsylvania.
50	39,000	19,500	35	38	7,410	Delaware.
47	560,000	296,800	35	38	112,784	Maryland.
47	2,994,200	1,568,926	50	40	627,570	West Virginia.
40	3,500,000	2,100,000	35	38	798,000	Kentucky.
52	14,025,000	6,732,000	48⅓	48	3,231,360	Ohio.
52	10,400,000	4,992,000	45	43	2,146,560	Michigan.
50	6,240,000	3,120,000	40	43	1,341,600	Indiana.
52	4,375,000	2,100,000	40	42	882,000	Illinois.
50	6,147,500	3,073,750	40	40	1,229,500	Wisconsin.
53	2,450,000	1,151,500	40	40	460,600	Minnesota.
50	4,160,000	2,080,000	40	44	915,200	Iowa.
50	3,867,500	1,938,750	38¾	42	814,275	Missouri.
.....	73,728,282	36,630,225	.....	.....	15,839,253	
39	1,710,000	1,043,100	35	41	427,671	Virginia.
42	871,250	505,325	32	38	192,024	North Carolina.
42	212,500	123,250	32	38	42,835	South Carolina.
40	1,000,000	600,000	32	38	228,000	Georgia.
42	400,000	232,000	32	38	88,160	Florida.
40	900,000	540,000	32	38	205,200	Alabama.
42	1,035,000	600,300	32	38	228,114	Mississippi.
45	620,000	341,000	32	38	129,580	Louisiana.
42	720,000	417,600	32	38	158,688	Arkansas.
40	1,275,000	765,000	32	30	229,500	Tennessee.
.....	8,743,750	5,167,575	.....	.....	1,929,752	
65	1,280,000	448,000	40	44	197,120	Kansas.
63	2,640,000	976,800	40	44	429,892	Nebraska.
58	3,295,500	1,911,100	38	47	898,217	South Dakota.
60	3,925,000	1,170,000	38	47	549,900	North Dakota.
63	35,567,000	13,159,790	43	47	6,185,101	Montana.
65	34,610,000	12,113,500	43	47	5,693,345	Wyoming.
66	13,125,000	6,162,500	40	47	2,896,375	Idaho.
74	4,760,000	1,217,600	40	47	572,272	Washington.
70	17,000,000	5,100,000	42	50	2,550,000	Oregon.
68	12,506,000	4,001,920	40	48	1,920,922	California.
70	4,118,000	1,235,400	43	50	617,700	Nevada.
65	16,900,000	5,915,000	40	47	2,730,060	Utah.
68	9,100,000	2,912,000	38	42	1,223,040	Colorado.
67	5,017,500	1,655,775	40	47	778,214	Arizona.
52	14,280,000	6,854,400	38	42	2,878,848	New Mexico.
68	9,360,000	2,995,200	43⅔	50	1,497,600	Texas.
63	390,000	144,300	40	42	60,606	Oklahoma.
.....	191,874,000	67,973,285	.....	.....	31,729,102	
60	274,341,032	109,771,085	41.1	45.1	49,498,127	Total, Fleece Wool.
33	42,000,000	28,140,000	36.7	39.7	11,181,000	Pulled Wool.
.....	316,341,032	137,912,085	.....	.....	60,679,127	Total Product, 1902.

GENERAL CONDITIONS.

The Wool Review says: "The only states which show any considerable increase in number of sheep since 1901 are Kentucky, Montana and Wyoming. In Kentucky the change arises from the correction of the estimated number consequent upon the census report, which gives 716,000 as the number in 1900. The estimate for the preceding year was 464,000. In Montana the increase is 555,000. Here the local estimates range from 4,200,000 to 5,500,000, while the census figures for 1900 are 4,215,000. It is apparent that there had been a large increase in the flocks; a careful investigation results in estimating the number for the present year at 5,081,000. The increase in Wyoming is the most striking. The estimate of last year was 3,580,856. The census report gives the number in 1900 as 3,327,000 and the Board of Sheep Commissioners reports 4,395,084 for this year. Inquiry leads to the conclusion that this number should be somewhat increased because of the failure of assessors to secure complete returns, and the number has been fixed at 4,614,750, an increase of 1,036,000 over last year.

Decline of Texas Wool Growing.

"The most notable change in the above table, as compared with the similar table of last year, is in the State of Texas, where we accepted the Department of Agriculture's estimate (in 1899) of 2,786,688 sheep, and where the census office found but 1,440,000 sheep in 1900.

"All our sources of information confirm this remarkable decline in Texas and indicate that it is still in progress. The census explains the loss by stating that nearly all available public land in Texas had been leased or fenced prior to 1900, thus being devoted to farms, and the range sheep-raising—that is, the grazing of sheep on public domain, has diminished correspondingly. Very few range sheep were found in the State; and this is undoubtedly the true explanation. Dealers have been struck by the steadily diminishing supplies of Texas wool.

"From all sources comes confirmation that the number of sheep east of the Missouri river continues to steadily decline. We can find no State which offers an exception to this rule, the change in Kentucky, above noted, being due to the correction of an error. The high price of meat during the winter had a tendency to increase the rate of decrease, offering an inducement to the farmers to kill. Buyers throughout the wool growing sections of the Eastern States report that they found supplies in smaller quantities than ever before.

The Limit of Range Grazing.

"On the other hand, while there have been large increases of flocks in two of the territorial States, it is noted that most of these States have reached the limit of their production. The best information we can gather, from persons actually familiar with the situation, leads to the conclusion that the ranges of Idaho and Nevada are quite fully stocked, while those of Utah are over-stocked, and the range is almost destroyed. In Colorado most of the range is still occupied by cattle, sheep being found in the southern portion of the State and upon the plains in the east. The ranges of Wyoming are about full. Montana can carry more sheep than at present, owing to the fact that sheep can range upon the plains during the summer.

"The continued establishment of forest reserves by the United States government has deprived the sheep men of important grazing lands in Montana, Colorado, Idaho, Wyoming, Oregon, Utah, and other territorial States.

"The situation offers little encouragement that we are likely to have a domestic supply of wool equal to the domestic requirements. The wool consumption of the present year is the largest in the history of the country, while the domestic supply is not as large as it was ten years ago."

Weight and Shrinkage.

"The average weight of fleeces is 6.50 pounds, as compared with 6.33 in 1901 and 6.46 in 1900, a slight increase in weight over both years. The average shrinkage of the year's clip is 60 per cent, as compared with 60.6 per cent in 1901 and 61.1 per cent in 1900. Marked variations in the per cent of shrinkage occur in the range States, the Oregon and Nevada fleeces showing the heaviest shrinkage as heretofore, 74 and 70 per cent, respectively, and Montana the lightest among the great wool producers, being again estimated at 63 per cent, the same as last year. The Wyoming average is reduced from 67 to 65 per cent, and Idaho from 67 to 66 per cent. Accompanying these conditions of weight and shrinkage are practically uniform reports of decidedly better quality and condition than the average of past years. The winter was unusually favorable for the flocks, with small losses and a good lambing season.

Available Supplies—1902-'03.

"The following table contains our estimate of the available wool supplies for the year 1902-'03—that is, pending the next clip and exclusive of the new imports from October 1, and supplies in manufacturers' hands. It is based upon the Boston Commercial Bulletin's record of supplies in dealers' hands on January 1 last, the Treasury Department figures of imports, and the figures of the preceding tables.

AVAILABLE SUPPLIES.

	1898 Pounds	1899 Pounds	1900 Pounds	1901 Pounds	1902 Pounds
Wool clip, fleece and pulled.....	266,720,684	272,191,339	288,636,621	302,502,328	316,341,032
Domestic wool on hand Jan. 1..	127,206,000	225,037,363	123,348,500	204,345,500	139,519,718
Foreign wool on hand Jan. 1...	49,581,000	66,131,327	25,265,000	29,483,500	13,619,600
In bond January 1.....	24,862,514	57,924,367	44,958,660	54,163,204	31,064,222
Foreign wool imported January 1 to July 1.....	68,938,927	45,824,632	95,875,523	59,560,310	100,858,377
Total	537,309,125	667,109,028	578,084,304	650,054,842	601,402,949
Imports of wool, July 1 to October 1.....					34,269,893
Total for 1902 to October 1.....					635,672,842

"It appears that the year's supplies (exclusive of the additional figures noted) are 48,651,000 pounds less than in 1901, notwithstanding a marked increase in foreign imports. It is anticipated that the supplies on hand January 1 next will show much smaller than last January, on account of the large consumption of the current year.

The Annual Wool Supply.

"The table below shows the quantity of wool retained for consumption in the United States from 1890 to date. As the wool clip of the year reaches the market during the governmental fiscal year, the clip of any year is added to the imports of the fiscal year beginning July 1 preceding, so that the total supply for a series of years is accurately indicated by this combination, however it may differ from the available supplies in any one year of the series:

WOOL PRODUCED, IMPORTED, EXPORTED, AND RETAINED FOR CONSUMPTION.

Fiscal Year...	Total Imports —Pounds....	Exports, Do- mestic and Foreign— Pounds.....	NET IMPORTS		Production— Pounds.....	Retained for Consumption —Pounds....	FINE WOOL	
			Classes I and II— Pounds.	Class III —Lbs..			Retained for Con- sumption —Pounds.	Per Cent of For- eign...
1890-91 .	129,303,648	2,930,045	36,783,501	89,882,024	309,474,856	435,848,459	345,966,435	10.63
1891-92 .	148,670,652	3,210,019	53,350,167	92,312,922	307,101,507	452,562,140	360,249,218	14.81
1892-93 .	172,433,838	4,310,495	46,189,082	122,026,119	333,018,405	501,141,748	379,115,629	12.18
1893-94 .	55,152,585	6,497,654	7,167,380	42,007,798	348,538,138	397,193,069	355,185,271	2.02
1894-95 .	206,081,890	6,622,190	98,388,318	105,402,507	325,210,712	524,722,428	419,319,921	23.46
1895-96 .	230,911,473	12,972,217	126,966,355	97,918,882	294,296,726	512,235,982	414,317,100	30.64
1896-97 .	350,852,026	8,700,593	235,282,735	112,141,457	272,474,708	614,627,365	602,485,908	46.84
1897-98 .	132,795,302	2,625,971	47,480,033	82,810,437	259,153,251	389,322,582	306,512,145	15.50
1898-99 .	76,736,209	14,095,335	3,349,870	60,947,423	266,720,684	329,361,558	268,287,135	1.25
1899-1900	155,918,455	7,912,857	44,680,424	105,525,783	272,191,330	420,197,228	314,671,445	14.20
1900-01 .	103,583,505	3,790,067	32,865,844	67,127,159	288,636,621	388,430,059	321,502,465	10.10
1901-02 .	166,262,148	3,227,941	69,315,286	93,842,199	302,502,328	465,536,535	371,694,336	18.65
1902-03 .	.....	.....	.....	.....	316,341,032	.....	.....	.....

“In the above table ‘fine wool’ includes all available supplies except the Class III., or coarse, native wools imported for carpet manufacture, The proportion of imported fine wool for the year 1901-2 has risen to 18.65 per cent, and is the largest in our history, except during the three years of free wool under the tariff of 1894. It is evident that the needs of the manufacturers are increasing faster than the domestic supply.”



GLIMPSE AT MR. DAWES' BUCKS, GALLATIN COUNTY.

RECEIPTS OF WOOL IN BOSTON IN BALES, 1896-1901.
(Boston Chamber of Commerce Reports. Elwyn G. Preston, Secretary.)

MONTHS	1896		1897		1898		1899		1900		1901		1902	
	Domes- tic	For- eign	Domes- tic	For- eign	Domes- tic	For- eign	Domes- tic	For- eign	Domes- tic	For- eign	Domes- tic	For- eign	Domes- tic	For- eign
January	28,027	23,877	25,476	18,931	13,640	11,803	21,194	6,794	29,029	10,465	23,529	5,669	52,668	7,204
February	18,514	33,038	29,803	49,676	20,584	21,973	25,605	11,494	22,954	14,337	22,139	6,517	43,728	10,163
March	19,755	34,302	26,300	80,320	17,968	19,057	27,446	5,709	21,566	22,084	38,085	21,618	43,050	23,104
April	20,139	12,389	28,109	164,364	13,573	22,235	23,344	8,925	15,973	32,853	37,859	10,353	36,165	31,165
May	43,183	19,135	39,509	66,646	14,008	6,934	52,899	6,064	22,010	15,027	56,863	26,828	59,881	15,473
June	59,341	5,781	47,002	52,517	38,308	14,000	105,888	7,961	39,055	8,322	69,174	7,215	93,828	5,437
July	69,603	5,214	100,277	41,858	67,629	1,612	137,673	3,552	61,837	7,891	116,869	9,746	146,719	10,796
August	52,347	3,654	92,521	70	53,524	3,596	109,012	6,791	69,721	5,450	112,354	13,438	125,821	16,596
September	21,584	3,069	63,764	2,229	27,691	1,398	46,246	9,699	35,482	6,707	66,892	5,279	61,484	9,113
October	38,855	8,785	46,699	9,071	15,913	4,973	49,731	10,955	25,208	5,206	34,839	8,467	.....	.....
November	33,586	14,648	32,347	8,329	10,660	4,059	51,455	11,799	14,132	11,473	51,505	9,063	.....	.....
December	37,120	47,587	19,182	17,183	23,723	5,596	50,720	14,605	20,848	5,773	49,099	6,485	.....	.....
Total	442,054	211,479	550,994	511,254	322,221	117,236	701,203	104,348	737,815	145,588	679,207	130,678	663,354	129,146
													9 mos.	9 mos.

AMONG THE GROWERS.

As to the general conditions prevailing in the sheep-raising business opinions vary among the growers, but there seems to be a prevailing sentiment that a marked change in methods is impending. The causes which will operate in this direction are chiefly the advance in cost of plant through the rise in the price of land, and the curtailment of available range areas

necessitating the labor and expense of erecting miles of fence, which could only be done on land that was under private ownership. Notwithstanding these so-called drawbacks, the business has been satisfactory in the main, even the adverse conditions resulting in permanent investments and improvements, and limiting to a great extent the drifting of nomadic bands from other states, brought here for grazing. The vast quantity, as well as the grade of the Montana wool crop, makes it compulsory upon the buyers to handle it and with the changes in methods which are being brought about through natural causes, Montana stockmen will remain in the vanguard of a permanent and fairly successful business. The disasters which have overtaken the flock masters in New Zealand, and which operated to such material benefit to American wool growers, cannot be recovered from in many years. The removal from the markets of the world of Australasian wool has had a wonderful effect upon the woollen industry, forcing the manufacturers into the use of substitutes to so great an extent as to create a demand for relief through national legislation, and wise action upon this subject will doubtless have a powerful effect upon the future of the sheep industry.

While there has been some disturbances of friendly relations between the sheepmen and the cattle men over ranges, they have not been so destructive and violent as in other states, and it is hoped they never will. Close feeding and droppings make range that has been used by sheep valueless for cattle, and this is the principal "casus belli" between stockmen.

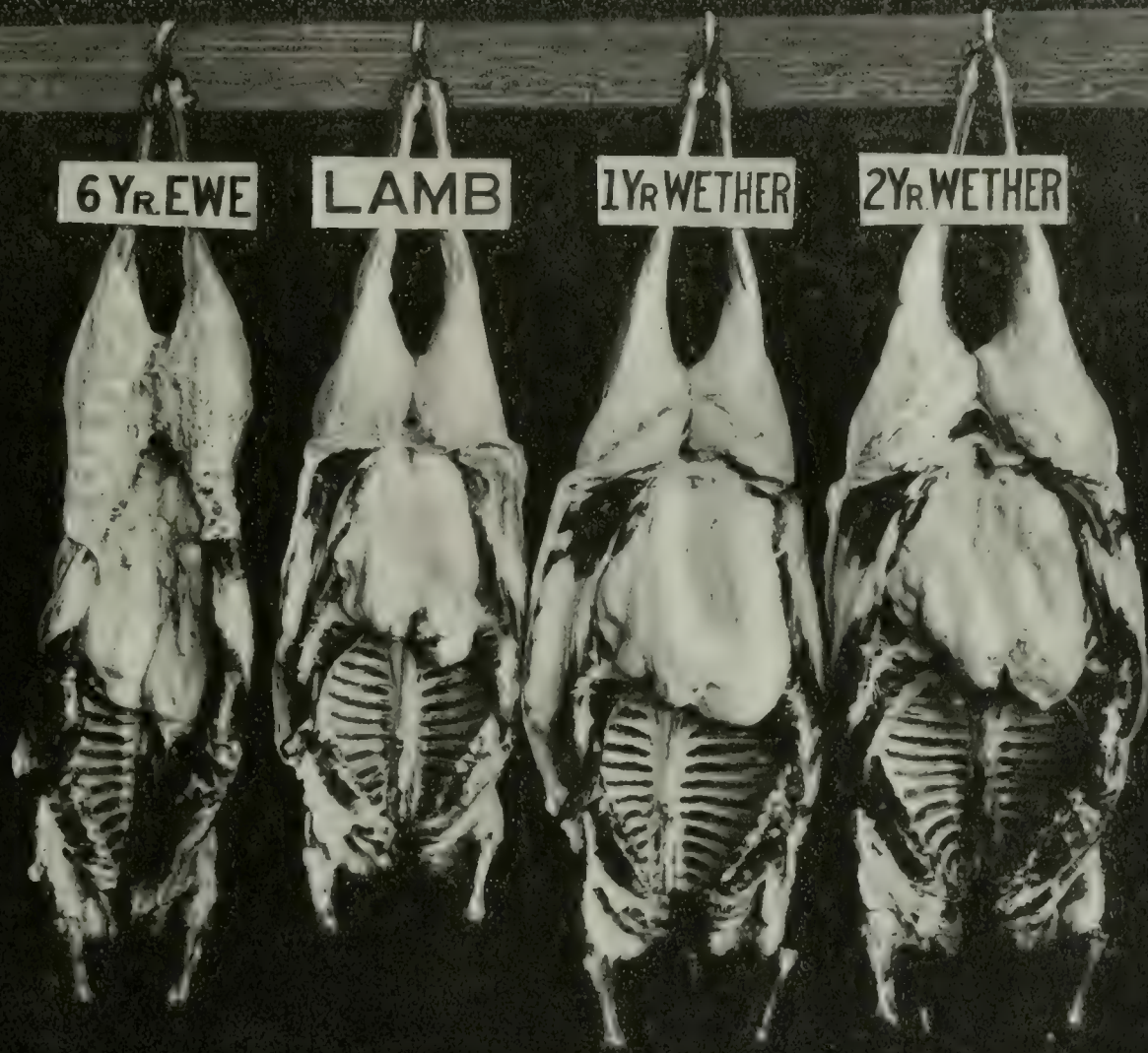
SHEEP FEEDING.

Exigencies arising from purely natural causes as well as an honest effort to improve herds, and the general conditions obtaining in sheep husbandry have, in recent years, led to extensive preparation and experiments in sheep feeding. It having become necessary that a change from old time methods be made the problem presented was, in what direction must the sheep grower turn to protect his investment and secure the best returns? Montana, already possessing the most remunerative and accessible ranges, it was useless to look for new territory outside the State. The alternatives were to go out of the business or make the necessary alterations at home. Naturally the attention of growers was turned to feeding, that is, producing the forage and grains necessary for growing and fattening from cultivated crops instead of depending entirely upon the ranges and the native grasses cured by nature. The results of these experiments, which cover a number of years, are instructive and valuable, and seem to point unerringly the direction in which the future of this great industry lies. Hundreds of thousands of sheep were fed during the winter of 1901-2, with unvarying success and, of the losses noted from storms and exposure, which were considerable, none were recorded among the bands so provided for. It is also believed that this method was responsible, in some degree at least, for the lamb crop of the spring of 1902, which was above the average.

A number of the letters received by the Bureau are given as showing

results from feeding under conditions as they exist on the ranches, and conducted by the owners themselves.

Mr. I. D. O'Donnell of Billings, says: "Two and three-year old wethers, fed four pounds of alfalfa a day, should gain 10 pounds in 60 days in the fall of the year." As the result of his feeding experiments he reports on four bands, giving the number of sheep fed, their ages and gain when fed on alfalfa for 45 days, an average of 4.44 pounds each a day, the alfalfa being figured at \$5.00 a ton.



THE RESULTS PHOTOGRAPHED.

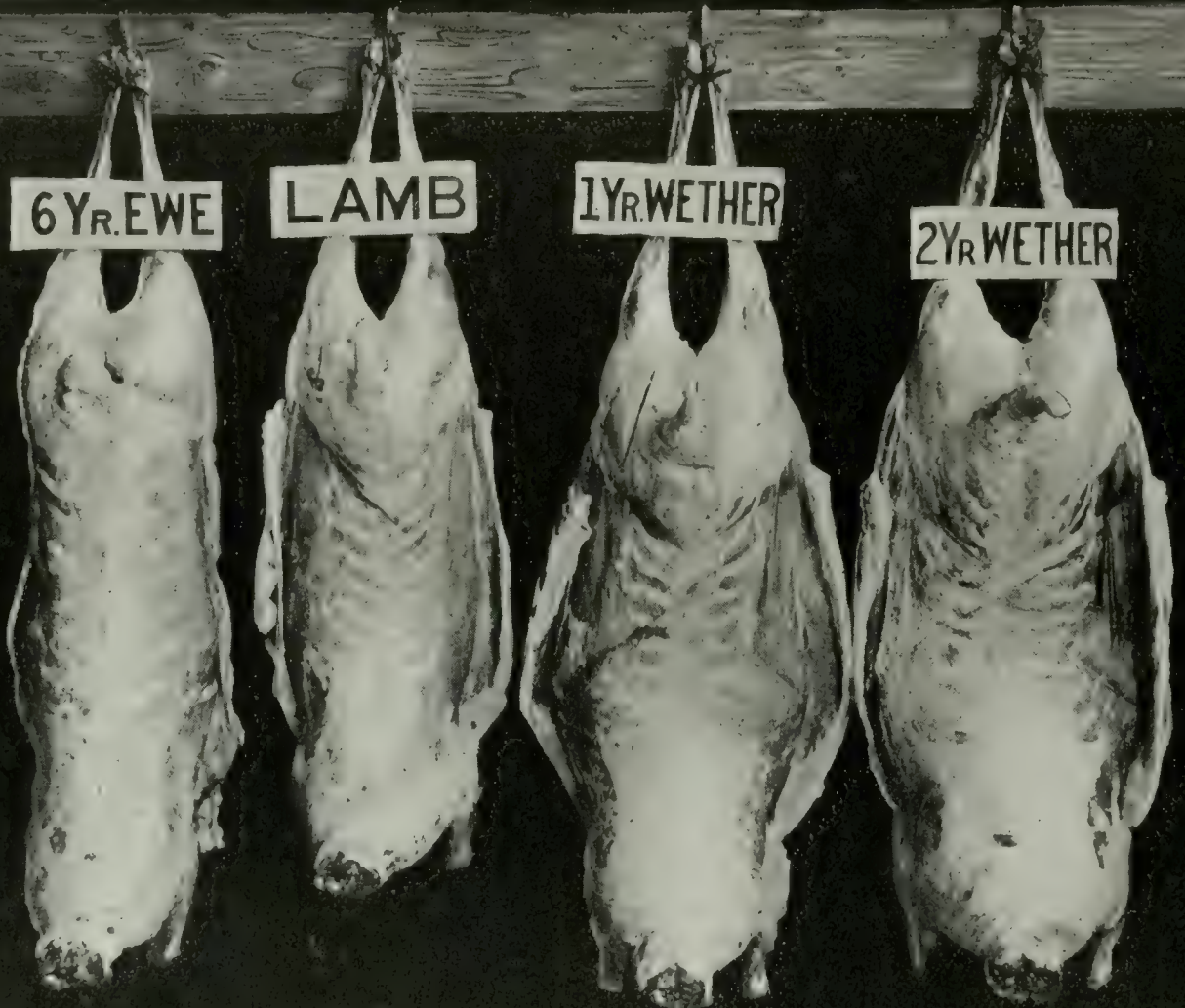
2,700 2, 3 and 4-year-old wethers fed 45 days gained.....	7 pounds
2,500 2 and 3-year-old wethers fed 45 days, gained.....	13 pounds
1,800 4-year-old wethers fed 45 days, gained	7 pounds
3,000 1-year-old wethers fed 45 days, gained	9 1-3 pounds

The loss of life from various causes during the time of feeding this large band was only 22 head.

In answer to an inquiry addressed to Mr. A. S. Lohman, he wrote: "I have been feeding 2,000 sheep of different kinds as an experiment this winter. I have fed some lambs, some two and three-year-old wethers and a few old ewes. The sheep that got fat the quickest were the three-year-old wethers; the sheep that was the hardest to put fat on were the old ewes; the lambs next, the yearlings and barren ewes next, and then the two-year-olds. I shipped all but my lambs to St. Paul on January 20, and sold them in South

St. Paul. After deducting the cost of feeding and their value at the time I began feeding in the fall, I made \$1.25 per head on them."

Mr. W. E. Harmon, of Bozeman, on February 17, 1902, responded to an inquiry, saying: "It is with a good deal of reluctance I write you regarding my sheep feeding. I made a bad failure in buying. The sheep fed were old ewes, in bad condition, delivered late to the ranch. My idea was to pasture the ewes on clover pasture and have them fat before winter set in. They were not delivered until October 15, three weeks after agreement. They weighed 78 pounds average. They were ranged on clover pasture



THE RESULTS PHOTOGRAPHED.

and weighed in 20 days 84 pounds average, in another 20 days 90 pounds average. In a few days snow fell and in a short time they averaged 85 pounds, although they were fed the best hay, clover, first cutting. Finding they would not be fit to ship we commenced to feed chop wheat, feeding in all 45 pounds per head in 50 days, feeding in the same time 150 pounds of good clover hay each. The sheep were fed one half the time on the ground, the other half in racks. They weighed 93 pounds average when sold and shrunk 10 pounds in shipping to St. Paul. The first two weeks after feeding ground feed they gained one pound a week apiece, the third week one and one-half apiece. Old ewes are entirely unfit for feeding. They do all right on good pasture. The sheep were well sheltered and fairly well watered. A year from now I hope to be able to report a different experience. This was my first experience and the mistake was made in the buying."

Near Billings and in the Musselshell and Yellowstone valleys not less than 500,000 head of sheep were fed during the winter with most satisfactory results.

So universal was the desire for information that the Experiment Station at Bozeman was deluged with inquiries as to the results of the experiments there which, for convenience sake were embodied in bulletin No. 35. This bulletin can be obtained by addressing the Station. Its chief features, however, are here given:

Feeding Tests with Lambs, Wethers and Ewes.

For four consecutive years this Station has conducted feeding tests with cattle, sheep and swine for the benefit of the local farmer. During the season just closed comparative data from feeding sheep of different ages was secured in response to numerous demands for the information.

Four lots of typical range sheep were procured and put on feed from November 22, 1901, till February 17, 1902, or 88 days. The food, water, surroundings and methods of feeding were the same in all cases.

Prices paid and weights November 22, 1901, were:

55 lambs, \$1.62 per head, average weight	62.9 pounds
51 1-year wethers, \$2.50 per head, average weight	94.9 pounds
53 2-year wethers, \$2.65 per head, average weight	115.7 pounds
53 ewes, \$2.50 per head, average weight	91.6 pounds

The food consumed and cost of same, was:

55 lambs consumed 9,958 lbs. clover at \$5.00 per ton	\$24.89
55 lambs consumed 3,304 lbs. barley at \$0.90 per cwt.....	29.73

Total	\$54.62
-------------	---------

51 1-year wethers consumed 16,960 lbs. clover at \$5.00 per ton.....	\$42.40
51 1-year wethers consumed 3,070 lbs. barley at \$0.90 per cwt.....	27.65

Total	\$70.05
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53 2-year wethers consumed 18,905 lbs. clover at \$5.00 per ton.....	\$47.26
53 2-year wethers consumed 3,195 lbs. barley at \$0.90 per cwt.....	28.75

Total	\$76.01
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53 aged ewes consumed 10,904 lbs. clover at \$5.00 per ton	\$27.26
53 aged ewes consumed 3,195 lbs. barley at \$0.90 per cwt.....	28.75

Total	\$56.01
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The average amount of food consumed per head, per day, was:

Lambs, clover 2.05 lbs., barley .68 lbs., total	2.73 pounds
1-year wethers, 3.77 lbs., barley .68 lbs., total	4.45 pounds
2 year wethers 4.05 lbs., barley .68 lbs., total	4.73 pounds
Aged ewes, 2.33 lbs., barley .68 lbs., total	3.01 pounds

The only surprising feature in the comparative data given above is the small amount of food consumed by the lambs. Their ration, however, contained a greater percentage of grain than the others as shown in the next table.

The relation of grain to coarse food fed was:

Lamb ration consisted of 24 per cent grain.

1-year wether ration consisted of 15 per cent grain.

2-year wether ration consisted of 14 per cent grain.

Ewe ration consisted of 22 per cent grain.

This ration was planned in order to give the four lots of different ages a uniform finish when put on the block, which it did as the slaughter test shows. The largest percentage of grain was furnished the lambs to give their growthy increase sufficient finish. This was not considered necessary in the case of the wethers which, being practically mature, put on a large proportion of fat in their increase in live weight. Attention is particularly called to these results as in no case did the grain form more than one-fourth of the ration. Such a small grain ration could only be used where legumes form the balance of the ration.

The increase of live weight during 88 days was:

Lambs, 23.7 pounds; percentage increase	37.7 per cent
1-year wethers 23.5 pounds; percentage increase	24.7 per cent
2-year wethers 24.3 pounds; percentage increase	20.9 per cent
Aged ewes 15.6 pounds; percentage increase	17 per cent

While the actual added gains are quite similar except in the case of the ewes, the comparative results are strikingly brought out in the percentage of increase determined from the original weight and the increase made.

The relative cost of production of the increased weight was:

Lambs, cost per 100 pounds increase	\$4.18
1-year wethers, cost per 100 pounds increase	5.83
2-year wethers, cost per 100 pounds increase	5.90
Aged ewes, cost per 100 pounds increase	6.78

In furnishing the above results attention is called to the fact that the lamb and ewe rations were practically the same in composition while the wethers received a trifle less grain in proportion.

The amount of solid food required for maintenance and per pound of increase, was:

Lambs, dry food consumed per pound increase	10.16 pounds
1-year wethers, dry food consumed per pound increase	16.6 pounds
2-year wethers, dry food consumed per pound increase	17.1 pounds
Aged ewes, dry food consumed per pound increase	17.5 pounds

These amounts are larger than they would have been had more grain been used in the ration. In a preceding test with lambs, where grain formed 33 per cent of the ration, one pound of increase was secured from 9 pounds dry matter. With clover alone fed to lambs, 11.7 pounds was required to produce a pound of gain. This data would, of course, vary with the kind of grain used. The figures given, however, present an accurate comparison between lambs and ewes.

These sheep were shipped to Chicago, a distance of about fourteen hundred miles, and purchased by Swift & Co., to whom we are indebted for the following slaughter test report:

55 lambs, average 79 pounds, price \$6.80, dress	54.2 per cent
51 1-year wethers, average 108 pounds, price \$5.85, dress....	52.9 per cent
53 2-year wethers, average 123 pounds, price \$5.40, dress.....	53.5 per cent
53 ewes, average 95 pounds, price \$4.75, dress	50.6 per cent

"We consider all of these sheep and lambs a useful class of stock, not too fat, and they dress about 2 per cent above the average coming to the Chicago market at the present time."

"The percentage of dressed weight is figured on a basis of actual weight immediately after killing, shrunk 3 per cent, which is about what mutton will shrink after hanging over night."

(Signed) "SWIFT & CO."

In determining the gains in live weight the sheep were weighed both in and out on feed, without shrinkage. The last weight before shipping

was taken between 2 and 3 o'clock P. M., the last feed having been given between 7 and 8 A. M. The shrinkage in transit was:

Lambs, 7.6 pounds each or 8.7 per cent.

1-year wethers, 10.4 pounds each or 8.7 per cent.

2-year wethers, 12 pounds each or 8.5 per cent.

Aged ewes 12.2 pounds each or 11.3 per cent.

The relative profits from the four lots, after charging up the coarse food at \$5.00 per ton, grain at 90c per cwt., and deducting all expenses were:

55 lambs gave a net profit of \$95.15, or \$1.73 per head.

51 1-year wethers gave a net profit of \$71.70, or \$1.40 per head.

53 2-year wethers gave a net profit of \$83.44, or \$1.57 per head.

53 aged ewes gave a net profit of \$1.00, or 0.018 per head.

During the spring of 1901 when prices were extremely unfavorable a car load of lambs, fed and shipped by this Station, netted us a profit of 31 cents per head in Chicago after paying for cost of food and defraying all expenses.

Summary of Feeding Facts.

(1). The feeding of lambs for market is more profitable than wethers or ewes, providing the ration is so adjusted as to give their rapid increase a finish.

(2). Owing to the growthy tendency of the lamb, its ration must possess more fat producing material than the mature sheep.

(3). Where grain is not available, the mature wether, though making a smaller proportionate increase, will fatten more readily than the lamb on clover or alfalfa alone. The use of from one-half to three-quarters of a pound of grain, along with clover or alfalfa, throughout a period of from 70 to 90 days, is necessary to produce a proper finish for shipping.

(4). For lambs, yearling and two year wethers and aged ewes, the following amounts of food were consumed per head, per day, viz: 2.73 lbs., 4.45 lbs., 4.73 lbs., and 3.01 lbs. Attention is called to the fact that the amount consumed by the lambs is small, due to their light weights.

(5). In order to secure an even finish, the grain fed formed the following percentages of the ration, viz: For lambs 24 per cent., 1-year wethers 15 per cent., 2-year wethers 14 per cent., aged ewes 22 per cent.

(6). The relative increase in live weight is represented in the following percentages: For lambs 37.7 per cent; 1-year wethers 24.7 per cent; 2-year wethers 20.9 per cent; ewes 17 per cent.

(7). The following amounts of air dry food were required for maintenance and per pound increase, viz: Lambs 10.16 lbs., 1-year wethers 16.6 lbs., 2-year wethers 17 lbs. and ewes 17.5 lbs. As heretofore explained, this comparison applies properly to lambs and ewes only, owing to difference in the proportionate make up of the wether rations.

(8). Relative costs of production per 100 lbs. increase: Lambs \$4.18, 1-year wethers \$5.83, 2-year wethers \$5.90, aged ewes \$6.78.

(9). Per capita cost of food consumed during 88 days: Lambs 99c, 1-year wethers \$1.37, 2-year wethers \$1.43, ewes \$1.05.

(10). Relative profits per capita from the four lots: Lambs \$1.73, 1-year wethers \$1.40, 2-year wethers \$1.57, aged ewes 1.8 cents.

(11). Percentage of dressed carcass after deducting 3 per cent from same: Lambs 54.2 per cent, 1-year wethers 52.9 per cent, 2-year wethers 53.6 per cent, ewes 50.6 per cent.

(12). Shrinkage in transit, covering 1,400 miles, determined from weights while on full feed and those of sale: Lambs 8.7 per cent., 1-year wethers 8.7 per cent., 2-year wethers 8.5 per cent., ewes 11.3 per cent.

(13). The suggestion, resulting from personal experience, is offered to the effect that sheep will withstand shipping better if kept on a limited

allowance during transit, rather than on full feed. But that feed and rest are essential toward the close of trip.

(14). The total net profit from the car of mixed sheep was \$251.29.

(15). Even though the cost of marketing is a large item, still, this is offset by cheap feeders and an abundance of cheap food of good quality which renders the feeding business a profitable industry.

SHEARING.

This forms an important branch of the wool business and has, in the main, kept pace with the improvements in other lines of industry. The old style of hand shearing, while still in use and destined to remain so for many years has, in places, given way to machine shearing in plants erected near the home stations, and generally by a combination of growers.

The sheep are driven from the range to the shearing station where the fleece is removed with clippers very similar to those used for clipping horses. The output varies with the size of the plant, but 40 good and experienced men will handle about 3,000 to 3,500 sheep a day, a little more than half of the men being shearers, and the others taking care of the sheep, tying and sacking the wool.

The principal advantages of this method are, less injury to the animals and a very appreciable improvement in the condition of the fleece. With the hand shears, in the hurry of piece-work, very greivous injuries are often inflicted upon the sheep, frequently of such a nature as to interfere with further breeding and always to the detriment of the wool bearing qualities, while the clippers are so constructed that this danger is reduced to the minimum, and at the same time, there is no unnecessary mutilation of the wool staple. Many improvements have been made upon the machines since they were first introduced and they are now giving satisfaction.

SHODDY.

It is not intended at this time to enter into any discussion of the merits of shoddy as a substitute for wool or to take sides for or against any of the bills already introduced in Congress upon the subject, but rather to enlarge, for a moment, upon the question of the use of shoddy in woollen fabrics which are now or hereafter to be made in Montana. As can be easily verified, the cost of buying and bringing to Montana, shoddy for mixing purposes, absolutely prohibits its use in this State. If, therefore, it is cheaper to use our native wools, the very fact that the goods were made in Montana would be a guarantee that they were all wool and thus a notable trade advantage would be gained without cost, and people would naturally turn to that market whose products in the very nature of things would be true to name. It is very certain that many of the goods sold as "all wool" are adulterated and the purchasers of them are deceived and wronged. It seems, also, reasonably certain, that Congress will, in the near future, require certain classes of goods to be labeled so that they will be sold for exactly what they are. Under these conditions the price of woollen goods is bound to advance and it is at this

juncture that Montana manufactured woollens will command attention in the market to the material advantage of grower and manufacturer. The field is broad and inviting. To allay the fears that wages in Montana would be prohibitive, the following quotation is made from the census bulletin on manufactures:

"The striking fact appears that the average number of wage earners employed during the entire year in the manufacture and finishing of all the cloth necessary for a population of over 75,000,000 people was but 640,548. It is a remarkable illustration of the power of machinery that much less than one person in a hundred was required to furnish the clothing of the American people. The number of persons employed in cotton manufacture was almost twice as great as that in wool manufacture which, again, was nearly three times that employed in silk manufacture.

How plainly this shows that machinery is the controlling factor in manufactures? This is not a plea for the establishment of woolen mills as employers of labor, but as the saviors of the enormous values now lost by selling raw wool, and to advance the interests of the wool growers by curtailing the use of shoddy, none of which could be used in the home mills.

A PROMISING MONTANA INDUSTRY.

No other industry to-day bids as strongly for recognition in the eyes of the farmer or stockmen seeking a new home as does that of raising Angora goats amid the mountains and on the rolling foot hill lands of Montana. It is now admittedly a most profitable industry and one that is gaining in public favor with leaps and bounds. Young in this country, it is true, yet, so far developed and now so well proven that no less a distinguished man than Secretary Wilson of the United States Department of Agriculture, recently said with encouraging emphasis, "The Angora industry is an American institution that has come to stay."

Naturally, hardy, rugged, and a thrifty "rustler," the Angora is in its natural home when under our Montana climatic and range conditions as they are very similar to those prevailing in Turkey, its own home country. Here the beneficial effects of a most desirable altitude and dry atmospheric conditions, a wide range of most nutritious grasses, weeds and browse all tend to produce an annual fleece of fine, long-stapled, lustrous mohair of greatest value and highest spinning worth.

As evidence and as proof that most favorable range and climatic conditions exist within our state we of Montana point with pride to the fact that here 5,000,000 sheep are ranged, the greatest number within any state in the Union; that it is admittedly one of the greatest cattle raising sections in our broad land and furthermore that its livestock of all kinds enjoys a national reputation in excellence and superiority. Surely this is indisputable evidence that Montana possesses most favorable conditions for all livestock industries.

Under the present existing conditions the ownership of large herds of cattle and immense numbers of sheep occupying long and well established locations on our ranges makes it difficult to look for development and growth in these industries through the new-comer or settler, whereas, in the Angora industry different conditions prevail. Naturally well adapted to the mountainous locations and doing best amid the hills and mountains where the widest range of vegetation and an abundance of clear mountain water abounds, the Angora promises to extend the borders of the live-stock industry of the state to heretofore untrampled and unused ground.

The mountainous districts of the State are almost entirely within the mineral land classification and hence large areas are not open for location, ownership or control of the speculator, the corporate or syndicate owner for his or its exclusive range use. It is here the Angora breeder can acquire a modest and inexpensive home location and, ranging his herds over these government lands without cost, can develop a business enterprise of great magnitude with comparatively little investment in land.

Such has been the experience of the many now engaged in Angora husbandry in the State and so successful has each breeder been that the develop-

ment of the industry is making most rapid progress and bids fair to soon become a most important factor in the livestock industry of Montana. Properly and quite fittingly Montana should become the greatest Angora raising state in the Union. It should, and undoubtedly will, eventually be the breeding place of Angoras for all the nation; the home of the best and most hardy animals and the ones best acclimated to northern latitudes and best



[From Thompson, Bureau of Animal Industry, U. S. Dept. of Agriculture.]

A MONTANA GOAT RANCH.

adapted for shipment to eastern farms. It is from here the nation should obtain its choicest Angoras as it does now its best horses, cattle and sheep. The Montana breeder of Angoras can look forward to not only a good home field in which to sell the increase from his flock but has the added advantage of having his hardy northern animals in especial demand in all of the eastern markets as well.

The maintenance of flocks for the growing of mohair is equally if not more profitable than is the growing of wool. The annual clip from the Angora has greater worth than is had from sheep. The cost of keeping is less and the percentage of animal increase is greater. The handling of Angoras is a matter involving less hazard and less loss than is met annually in sheep husbandry.

The meat worth of the Angora is on a par with that of range sheep. They are taken readily in the Kansas City and other markets. Angora

venison is a most palatable meat food and one that is coming rapidly into general use. The handsome, silk-like, fleeced pelts are a most valuable product additional to the meat worth and one adding materially to the return to the breeder and grower from slaughtered stock.

The demand for mohair in the United States is far in excess of the present home production. The limited lines of manufactures, (plushes, robes, rugs and recently mohair-wool dress goods,) consuming far more than is produced in the entire country. The adaptability of mohair for many other uses makes it readily apparent that the consumption will keep pace with an increasing production in the years to come. Admittedly the most beautiful



[From Thompson, Bureau of Animal Industry, U. S. Dept. of Agriculture.]

ANGORA KIDS ON THE BRANNIN RANCH, 18 MILES FROM HELENA.

fibre known, more beautiful even than silk, stronger and more durable than wool and of such a character as to take most fast and permanent dyes, it certainly possesses all the requisites in merit to gain the recognition it well deserves.

There are now approximately 8,000 to 10,000 Angora goats in Montana distributed well over the entire State. One of the oldest flocks is that of S. S. Brannin of Silver Station in Lewis and Clarke county. Mr. Brannin being a very successful breeder of many years experience in the state and an enthusiastic and firm believer in the superiority of Montana conditions over those of other states for the greatest development of the Angora industry. Mr. Brannin's last shipment of mohair (1902) commanded 37 cents per pound at the Sanford Mills at Sanford, Maine, and was referred to in a letter from these large consumers as being mohair of a class and grade above the average American-grown fleece. A decided compliment to Montana conditions.

Mr. T. C. Miles of Silver Bow Station in the county of that name, a prominent sheep owner, has also owned Angoras for many years but only, however, in connection with sheep. He now declares his sheep are "for sale" or "to let" as he wants only Angora goats. Relative to the ease in handling and the healthiness of the Angora, Mr. Miles says: "They require less care than any animals that I have ever owned, are less subject to disease and do come nearer taking care of themselves than any other kind of stock." "Here in the head of the Deer Lodge valley where we have been cursed with local diseases in our horses, sheep and hogs, the goat has gone through without a blemish."

Mr. G. D. Martin of Big Elk, in Meagher county, another large sheep owner is now raising Angora goats, and successfully, and without detriment or loss is ranging them in a section known as particularly bad for sheep owing to the poisonous growths prevailing there, but which have no ill effects on the goat.

At Bozeman, in the famous Gallatin valley, Senator Charles W. Hoffman, John S. Craig and A. B. Blackwood have each proved the value of the Angora in clearing land of brush and weeds and have conclusively demonstrated the keen worth it possesses in this respect to the average farmer.

The Montana Angora Goat Company of Helena, has made large shipments of high grade Angoras into the State, and possesses a flock of particularly high class registered stock to which they have recently added one of the finest Angora bucks in the world, an animal of direct descent from the last importation of African stock into America and one of the first prize winners in the last national competitive exhibit at Kansas City, Missouri.

That Montana conditions attract attention from beyond the borders of the State is evident from the fact that a resident of Rochester, New York, has recently engaged in the Angora industry here, having chosen this field in preference to any other part of the entire country. Mr. Charles E. Shone, now of Avon, Powell county, the gentleman referred to, having acquired an ideal Angora ranch on the Little Blackfoot river in that county where, ranging his flock of five hundred high grade Angoras, he is laying the foundation of an enterprise of great promise.

Flocks of Angoras are now to be found in nineteen of the counties of Montana and a keen interest in the industry is manifest throughout the entire State. Much literature is now available on the subject, the Government bulletins issued for free distribution by the Bureau of Animal Industry of the Department of Agriculture at Washington, D. C., being complete and exhaustive works on the Angora industry. The livestock journals of the country are now devoting much space to the industry and one desirous of learning of the Angora has much material from which to draw. The industry is one of great promise in Montana and is deserving of the attention of the progressive range owner and the prospective new settler and husbandman as well.

PROFITS IN ANGORA GOAT RAISING.

To Mr. John W. Fulton, Secretary of the Montana Angora Goat Company, Helena, the Bureau is indebted for the following table of estimates

LABOR.

See yonder poor o'er-labored wight,
So abject, mean and vile,
Who begs a brother of the earth
To give him leave to toil.
And see his lordly fellow-worm
The poor petition spurn,
Unmindful, though a weeping wife
And helpless offspring mourn.—Burns.

It is difficult, if not impossible under any circumstances, to consider the relations existing between the two great factors of production, the laborer and the capitalist, without some recognition of the great economic principles which are to-day attracting the attention of the profoundest minds of the world; and, while much to be desired, it is equally difficult to conduct an investigation and formulate conclusions therefrom without allowing preconceived ideas, or a very natural bias, to influence one or both. It is unfortunate that in some of the Labor Bureaus political necessities have apparently been allowed to influence conclusions in so marked a degree as to enable the reader to forecast the political complexion of a state's administration simply by reviewing its Labor Bureau's report. Aside from the ethical questions involved in such instances is the fact that statistics gathered under such circumstances are not only valueless, but they are worse than useless because misleading. The student of economics, as well as all others, must depend upon facts for his conclusions, and the facts alone should be given whether they coincide with the views of the investigator or not.

Undoubtedly there is great value in statistics upon labor. The hours, wages, rate of production, the beneficial and other features, all have a vast influence upon commercial enterprises and are more closely studied than many people are aware of. But probably the most useless of all is the long array of figures which purports to show average wages in the various trades that are based entirely upon the current wage scale of that trade. For instance, of what earthly value, beyond the mere statement of a fact, is the information that the wages of a plasterer in Montana is \$7 for a day of eight hours unless it is accompanied by the further details of how many yards of plastering is held to constitute a day's work, and how many days in the year each plasterer has had employment. It is manifestly unfair to assume that a Montana plasterer's wages are \$2,100 a year because there are 300 working days in the year and the wages are \$7; and yet, that would be a logical conclusion unless further details were added. As a matter of fact, and not-

withstanding the high rate of daily wages in many trades, the actual yearly earnings of Montana mechanics are very low, and in the greatest industries in the State—those of mining and smelting—where employment is the most steady, the yearly individual wages are not great owing to the fact that few, if any, men are physically able to follow these avocations without taking periodical rests; and, again, there is a fraternity among the men that impels many to take a vacation simply that the unfortunate idle brother may have a chance to earn a few dollars. The Bureau has been able to secure statements from a large number of tradesmen and others regarding their yearly earnings which fully corroborate the foregoing. In one city there are 12 mechanics in a certain trade and during the past 10 years the wages have never been below \$5 a day; and yet, the average wages of these 12 men for that long period have never exceeded \$200 a year, except during 1901, when there was an exceptionally large building under construction. On the other hand there are instances of large yearly earnings through steady employment that prove the other extreme of the question. The vital point, however, in any conclusion to be drawn, and one which absolutely fixes the matter of high or low wages regardless of the rate by the day, is the determination of their ratio to production. How often is it said that one man is worth more than the scale of wages and that another is not worth half of it? Wages are high or low just in proportion to the results accomplished. This is fully established by a comparison of American with English, French or German labor. Hon. James G. Blaine recognized this fact many years ago when he stated that, "taking into consideration the number of yards of cloth produced, the English weaver received higher wages than the American," and he said this without any reference to the cost of living. It is, therefore, necessary in arriving at any conclusion regarding wages to take this point into consideration, and any hasty statement that wages are so high as to be prohibitive without such consideration has but little value for the purposes of an economic discussion. The following figures are taken from the Census report devoted to the Manufactures of Montana, and clearly illustrate the above contention.

In the year 1890 the total number of employees in the State, including all salaried and office employees, male, female and children, for which the figures were returned, was 2,696, and they received in wages the sum of \$1,948,213, or an average for the year for each employee of \$723. The total value of the product from their combined labor, including receipts from custom work and repairing, was \$5,507,573, or an average product for each employee for the year of \$2,043. The average salary for office employees for 1890 was \$955.

In 1900 the whole number of employees reported is given as 10,117, including the same classes of employees as for 1890. The total sum paid for wages was \$7,969,886, an average for the year of \$788, and the total value of the product was \$57,075,824, an average product for each person of \$5,642. The average salary for each office employee was \$1,488.

From these figures it is shown that while each employee produced a value of \$2,043 in 1890, for which he received as wages \$723, the rate of produc-

tion in 1900 had increased to \$5,642 for which the worker received \$788. In other words the wages had increased \$65 a year while the per capita of production had increased \$3,599 a year, conclusive evidence that, considering the ratio of production, wages were relatively much higher in 1890 than in 1900. Nor should the fact be lost sight of that the salaries of office employees were advanced from \$955 in 1890 to \$1,488 in 1900, equivalent to an average advance of \$533 a year, as against an advance of \$65 a year for all employees. It is well, also, to remember that in the 1900 report all the smelters and reduction works are included, which was not the case in 1890—a circumstance which undoubtedly accounts for a great part of the advance in both cases, salaries and wages in these industries, being comparatively higher than in the various trades and employment more steady—improvements in the trades being generally confined to a reduction in hours.

Consider the subject of wages and production in Montana as compared with neighboring states as shown in the following table:

	Av. Yearly Wages	Av. Yearly Production
Montana	\$788	\$5,642
Arizona	723	6,526
Wyoming	618	1,921
Idaho..	583	2,721
Washington	565	2,567
North Dakota.....	510	3,838
Oregon	483	2,664

It is at once apparent that wages in all these states, with the exception of Arizona, are higher when thus considered, than they are in Montana.

But there is still another matter to be taken into consideration, and that is, that there are more men employed in the state than 10,117, and that while those enumerated are employed in the greatest wealth producing industries and are generally organized and receiving the highest wages, those who are not included in the returns are the very ones who are employed at the lowest wages and who, if included in the tables would materially reduce the average of wages. It is absolutely certain that the workingmen of Montana will consider the average wages of \$788 a year as much higher than the amount they are actually able to earn in that time. Sickness, weather, shut-downs and many other things operate to reduce the yearly earnings of the the individual, making it impossible to earn such wages.

Generally speaking it is true that wages in Montana are higher than in other localities when the rate per day is considered without reference to production or cost of living. The latter is undoubtedly higher here than in probably any other State in the Union, and has an unquestionable effect upon the wage scale. It is in combating what is known in political economy as the "Iron Law of Wages," that the trade union method of collectively fixing wages finds its greatest justification. Trades unions are a product; not a cause. This law is that, "the natural trend of wages is toward the lowest sum that will enable the laborer to live." Under the present system the successful applicant for work is the one who can support himself and his family the cheapest and can, therefore, work the cheapest. But here the

union steps in and declares, rightfully, that the minimum wage shall be fixed at the point where the mechanic can support his family and educate his children by his own unaided exertions, regardless of the fact that the fellow-worker without a family can exist on a less wage—and might even be willing to do so. It is to the credit of Montana employers that they generally recognize the justice of this position.

There is another point in connection with high wages that should not be overlooked, and that is, that the prosperity of a country depends largely upon the power of the producers to consume or purchase that which they produce, or its equivalent. It is very evident that a reduction in wages means a reduction of consuming power; and that with high wages the workers are enabled to buy more of that which they have produced than is the case where low wages prevail. No merchant would be willing to exchange the patronage of a community of high-wage mechanics for that of even a much larger number of low-paid wage-earners; or the so-called tyranny of the labor unions for the deadly competition of a company store in a corporation town. Every business man knows that the merchant doing business in a high-wage community handles more dollars in the course of a year and makes a greater percentage of profit on every dollar that passes through his hands than the man who is located in a low-wage town. Therefore, aside from any theorizing or abstracting upon the proposition, the fact is that in the most intense sense the merchant's interest lies concretely with the wage-earner off of whom he chiefly makes the profits that furnish him his living.

The industrial problem involves the whole plan of human existence—the why of life. There are, to-day, two schools teaching the purposes of life; one, apparently in the ascendent, affirms in practice that the whole aim of human endeavor is accumulation of wealth through the toil and necessities of others. The other proposes that the true object of life is human happiness; to develop the best in man spiritually, morally and intellectually—recognizing in the fullest sense the Brotherhood of Man, which is held to be incompatible with the practice of one life sustaining itself upon the products of another or winning a surplus at the expense of another.

The first is finite, limited in scope, productive of both good and evil; breeds incarnate selfishness and carries within itself the elements of its own destruction. The second is infinite, calling for the exercise of divine justice; proposes the abolition of the chief incentives that nurture greed, thereby permitting free play to the operations of the Golden Rule, and making life happier for all by the inauguration of a more equitable system of production and distribution. It is for the latter ideal, though in a weak and imperfect manner, that the labor organizations are striving. Few are those who are entirely satisfied with the present system. To them it is impossible to reconcile the ideal life with any system that compels many to toil in danger and privation that one or a few may live in luxury. It is impossible that the primary object in life—which must be common to all—divides itself by divine will or human necessities into poverty and hardship for one and riches and idleness for another. It is impossible to justify a condition that

compels many to toil that one or only a few may eat. Abraham Lincoln said: "If this were true the toilers would have been created with many hands and no mouths and the idlers with many mouths and no hands."

In such a system there is little excuse for living; no reason for life. In the arrangement of human affairs it is only where the highest development of moral and physical attributes of mankind are fostered that life can be justified and, insofar as the labor unions make for the realization of such conditions, they are to be supported and upheld as factors in the Great Evolution.

The training and discipline afforded in the management of the internal affairs of the unions are exerting a marked influence upon their members. While there still remains an element subscribing to the "rule or ruin" policy of former days the circulation of trade journals and the study of economics have become so general that these members have lost their power for evil and a more conservative element predominates. As in other bodies, the chief difficulty has been an attempt to control effects without a thorough knowledge of the causes which led to them, and many failures can be traced to this starting point. To-day, however, the successful labor leader must have accurate knowledge of conditions equal, if not superior, to that of the employer, and, in addition, must possess the completest confidence of his associates. He must have the ability to organize as well as execute, and must be actuated by the single purpose of advancing the interests of the individual members of this organization. Under such leadership, and with a tried and loyal membership, strikes of any magnitude are seldom resorted to—never, in fact, except to defend principles, or the existence of the organization.

The principles of arbitration form the ground work of every labor organization. Strikes are universally prohibited in every constitution, under severe penalties, until every means for peaceable settlement have been exhausted. Mutual concessions have come to be depended upon rather than force, and a better understanding of what is due from each to each has taken the place of destructive antagonism. Both employer and employee are rapidly becoming cognizant of the fact that there is a better way of settling labor disputes than by appealing to brute force. Mutual concessions and the recognition of the principles of arbitration will in most cases effect a settlement of differences if there is an honest willingness to accord justice on both sides, and a joint recognition of inviolable rights.

The present proud position of the United States as a manufacturing nation has not been reached through ill-paid, over-worked labor, but by reason of the skill, brains, and consequent producing capacity of its high-wage mechanics. There is no disposition to conceal the fact that there have been instances of injustice on the part of some labor organizations. The only wonder is, taking all things into consideration, that the cases have not been multiplied.

A strenuous effort has been made to record every labor difficulty which has occurred in the State during the past two years and, while some of them were quite serious in their nature, owing to the great interests involved, it is

gratifying to note that nearly all were amicably settled and friendly relations established which promise well for the future peace and prosperity of the State.

STRIKES AND LOCKOUTS, 1901.

During the year 1901, a number of laws purely in the interest of labor became effective and in only two instances was there any danger of serious disturbance. Both of these were more or less due to the eight-hour law for men employed in mines and smelters, and were in the latter industry. It is but fair to say that one of the difficulties originated more in opposition to the men becoming organized than in opposition to the law, and in the other, to an effort to reduce wages when the law took effect. In fact, the majority of the employees affected by the law, received the benefit of the reduction in hours before the law was passed, and the two cases referred to were such as would undoubtedly have occurred even without the eight-hour law, though there appeared to be an intimate relation.

The other disturbances of friendly relations between unions and employers which took place during the year, while they are of minor importance, show a wonderful discipline among the union men, and emphasize the fact that there is more satisfaction in dealing with a committee or general officer representing an organized and compact body of men who have discussed and decided upon what they regard as their rights, and have thus learned to respect the rights of others, than there is in dealing with irresponsible and unorganized employees.

The first difficulty of the year 1901, was at St. Regis and occurred between the local union at that place and the Sullivan Brothers, and was in the nature of a lockout, the firm discharging all of their employees who were members of the union on account of a man who, while willing to accept all the benefits which the union conferred, was not willing to join the union and help support it. The men were out of work for some time but eventually a settlement was affected and the men returned to work while the cause of the trouble left the camp.

Following this came a strike of carpenters on a building in Billings, February 28, caused by the hiring of non-union men by the contractors. This difficulty was settled the same day that it occurred, the men gaining their point and returning to work.

An March 1, the machinists of Anaconda went on strike in common with their fellow-machinists of the United States and Canada to enforce a nine-hour day and for a slight advance in wages per hour. They had been receiving 40 cents per hour for 10 hours work and demanded 45 cents per hour for 9 hours. About 60 men were originally affected but, owing to the closing down of different departments, unable to work while the machinists were idle, over 600 men were thrown out of employment and two mines were closed. The strike lasted until May 15, when all the demands of the union having been put into effect by the company and the union having been recognized, the men returned to work.

The strike of the machinists in the Montana Central railroad shops at Great Falls for a nine-hour day and higher wages was lost, the company re-

fusing to reinstate the men even after the strike was declared off. This trouble lasted from March 1 until June 22, and most of the men left to look for work in other places.

A peculiar strike occurred on March 7 at Dewey, near Forsyth, among the laborers employed by railroad contractors. Small-pox had broken out and the camp had been quarantined. The men notified the contractor that so long as the quarantine remained in force they would do no work but would require their regular meals. The sheriff was instructed to notify the men that those who refused to support themselves would be arrested, taken to the pest house and treated the same as patients. Under this treatment the strike was declared off and the men returned to work, but a few days later a second strike was inaugurated which resulted in the discharge of 180 men and the closing down of the work.

On March 13, the iron molders of Butte struck for an advance of 50 cents per day of 10 hours. They had been working for \$4 per day. Their demands were acceded to after being out for 48 hours and the scale was signed by all the firms interested.

March 23, Marysville was the scene of a slight disturbance over the presence of some non-union miners, but happily the obnoxious men left the camp and peace was restored. There was also some fear that there would be trouble over the enforcement of the eight-hour law, but this proved to be unfounded.

On the same date several hundred employees of the Anaconda Company at the Belt coal mines struck, the company having refused to grant their demands for an advance in wages. This trouble was settled in a few days through the company complying with the requests of the men.

The 67 employees of the Rock Springs Coal Company at Sand Coulee struck against certain conditions existing at that mine. The grievances were a change in the wage system from \$3.50 per day to 75 cents per ton of 2,000 pounds; and dissatisfaction over the weights. There was also a rule in force requiring miners to saw their own timbers, and differences as to charges for blacksmithing. The men were out for a few days when, claiming that they had secured all the concessions they wanted, such of them as were needed returned to work. On April 8, the men again struck—claiming that four men had been discharged for their participation in the former strike, and that work had been reduced to four days a week in an effort to “freeze” the men out. The management denied these allegations and through the efforts of the union officials matters were amicably adjusted and the mines resumed operations.

April 18, the iron molders of Helena, upon the refusal of their employers to grant an advance from \$4 to \$4.50 per day, walked out. Six men were affected and simply left the shop. Efforts have been made from time to time to settle this trouble but without avail, and, at the present time the conditions are the same as when the walkout took place.

Twenty-eight men, members of the masons and bricklayers' unions of Butte, struck on April 22, three buildings under construction in that city. These unions have rules which prevent them from working for sub-con-

tractors, and struck to enforce this rule. The difficulty was settled in a friendly way and all differences having been adjusted the men returned to work.

On May 1, the coal miners at Aldridge, Bridger and Red Lodge became involved in trouble owing to differences which covered many points, the Aldridge affair being settled the first of the three. The trouble here arose over a rule that any miner sending out over 3 pounds of dirt to a car should be discharged. The union demanded that the miners who had been discharged under this rule should be reinstated, and this was granted temporarily, pending decision from the New York officers of the company.

At Red Lodge the concession of eight hours under the law, as passed by the Seventh Legislature, was accompanied by a reduction of wages which the miners refused to accept and, as a consequence, the owners declared a lockout which affected 500 men. Men working on company account who had been getting \$3 a day of 10 hours were notified that they would have two hour's wages cut off their time, thus reducing their pay to \$2.40 a day. Drivers who had been getting \$2.85 a day would be reduced to \$2.28. On May 4, the company submitted the following proposition to the Miners' Union where it was accepted without modification and the mines resumed work:

"Red Lodge, Montana, May 4, 1901.

"To the Employes of the Rocky Fork Coal Company of Montana:—Operations will be resumed at the mines and works of the Rocky Fork Coal Company of Montana, on Tuesday morning, the 7th instant, under and upon the conditions and terms hereinafter mentioned, to-wit:

"The company will pay all classes of labor under and above ground the same wages and prices that have been in force and effect for the past year. All employees engaged in work above ground, on the outside or in the stopes and power houses, to report for work at the same time and be on duty the same number of hours and under the same conditions and terms as have obtained during the past year.

"All employees engaged at work underground will be required to render and perform eight hours actual service at their respective working places and to go to and from work and lunch on their own time. Outside men, top men and loaders will be required to report for work at 7 a. m. Miners employed underground will be required to be at their respective working places in the mine at 8 a. m., and work until noon, take one-half hour for lunch, resume work at 12:30 and work until 4:30, at which hour they will 'shoot.' Drivers, trip drivers, and all other day men employed underground, will be required to report for work at such hours, respectively, as will be arranged with them individually by the superintendent, and each will be required to perform eight hours' service for a day's work.

"ROCKY FORK COAL CO."

The strike at Bridger, which involved 145 men, began on May 1, and continued until August 1, when a compromise was effected and work was resumed under a scale which was in the nature of an experiment. The primary cause of the difficulty was a reduction of the price of mining coal from \$1.00 to 75 cents a ton. After the men had refused to accept this reduction, and while the strike was on, the company proposed a change in the system of mining, which, in a modified form was afterward the basis of settlement.

At one time during the strike there was a few non-union men at work but these quit of their own accord claiming that they could not make wages at the reduced prices. The union granted permission to their members to assist in preserving the mine property by allowing them to enter the mine to take out the rails, pumps and machinery, and this was done, as the company had declared its intention of closing the mine permanently. There was also a conflict of authority among the miners, and on June 9, the strike was declared off and he proposed reduction was accepted. This action was not satisfactory, however, to a majority of the members of the union, and was repudiated at once and the strike was declared to be in full force and effect. At last, after considerable negotiation between the company and representatives of the miners, the whole difficulty was settled upon the following terms August 1: Under the long-wall system the men to receive 85 cents per ton and to build their own cribs and packs. For room and pillar work, 90 cents per ton. Also the men to receive the benefit of a 20 per cent reduction in house rent. Since this scale was put into effect the miners have been steadily at work, and the prospects are good for its permanent adoption.

It was also on the 1st of May, that a disagreement culminated in the closing down of the American Smelting and Refining Company's plant at East Helena. About April 26, the company posted notices to the effect that when the eight-hour law went into effect there would be a general reduction in wages amounting to from 12 to 20 per cent. A number of men quit and the vast amount of dissatisfaction, which the notice caused, led to many meetings of the employees at which the formation of a union and the best means of resisting the proposed reduction was discussed, and a number of conferences were held with the management. The management stated that under no circumstances would it recognize or tolerate the formation of a union, and demanded that the men should sign an agreement to that effect. This, the men promptly refused to do, with the result that the plant was closed. But, after a few days, a notice was posted that work would begin under a reduction amounting to from 10 to 12 per cent. The men, having signed no agreement regarding the formation of a union, and nothing being said about it in the notice of resumption of work, immediately applied for a charter from the Western Federation of Miners, but this action resulted in the company discharging every man who became a member, and efforts were made to fill their places by bringing men from the East. There exists absolute proof that these men were brought here under contracts that were not fulfilled, and the new men left, after an attempt to secure redress through law, which was unsuccessful, owing to the fact that action would have to be brought in Minnesota, where the contracts were made, and that the men were wholly unable to return owing to a lack of money. Nearly 800 men were involved in the smelter and the mines which depended upon these works for the treatment of their ore. The plant is now running under the reduction. It is worthy of notice that as East Helena was the only unorganized smelter in the State, so it was the only one where a reduction of wages was made as a result of the eight-hour law.

During a portion of the months of May and June, 1901, the great smelt-

ing plants of the Butte & Boston Company and the Colorado Smelter of Butte, were closed down. The general public seemed inclined to attribute the action to various causes, but generally it was traced to the passage of the eight-hour law for employees in mines, mills and smelters. The Bureau has been at some pains to secure careful statements from the parties to the controversy which could be authoritatively recorded. The statement from Mill and Smeltermen's Union is as follows:

"In June, 1900, seven months before the eight-hour law was passed, and nearly a year before it went into effect, the Butte Mill and Smeltermen's Union decided to take some steps toward securing a reduction in the hours of labor of its members. With this end in view a committee was sent to the smelter managers with a request that an eight-hour day should be granted their employees who were at that time working eleven hours on day shift and thirteen hours on night shift. The managers did not, at that time, see fit to grant the request of the union, but stated that such action would result in closing the smelters. Nothing more was heard of the matter until May 1, 1901, when, the eight-hour law having been passed by the Legislative Assembly which had convened meantime, and the law having become operative on the last mentioned date, all the smelting companies except the Butte & Boston and the Colorado smelters gave their employees the full benefit of the law. The union, through its committee, again asked the managers of these latter named companies to grant the eight-hour day to their yard men, machinists and machinists' helpers as had already been done by the other smelters. This request affected 15 men in the Colorado works and 45 in the Butte & Boston. The managers of these companies promised an answer in ten days and at the expiration of that period asked for an extension of time, which was granted, and the 10th day of June was the date on which a final answer was to be made. The union decided to call a meeting upon that date if the answer should be in the negative. The committee from the union called upon the manager of the Butte & Boston smelter on the evening of June 10 and were informed that their request would not be granted. Four hours before this meeting was held both these smelters had closed down. On June 11, the manager of the Colorado gave the committee the same answer.

"This whole matter was considered at a special meeting of the union on June 12 when it was decided that, as the smelters had closed down before the answer to the union's request had been given, thus giving the union no option in the matter, that the organization of employees could in no way be held responsible for the shut-down. The men were locked out. The managers of the smelters, realizing the justice of this position, at once began calling meetings of their employees regardless of the union. The Butte & Boston made arrangements whereby the works were opened on June 16 under the same conditions that were in force previous to the shut-down except that the general machine shop was indefinitely closed. The manager of the Colorado company presented the following agreement to his employees for their signatures:

'Butte, Montana, June 28, 1901.

"This is to make known to the Colorado Smelting and Mining Company that we, the undersigned employees of said company, are willing to return to work under the same conditions that existed before the shut-down of the smelter on May 16, 1901. We furthermore wish to make known to said company that many of our fellow employees are absent at the present time, and can for that reason not add their names to this list.

"Therefore, be it known unto said company that we, the undersigned,

have hereto signed our names on condition that said company shall have no prejudice against any of the old employees, be they present or be they absent.

'Respectfully,'

(Signatures of employees.)

"The employees present rapidly signed the agreement although they had never refused to work under conditions as they existed before the lock-out, but were simply engaged in a peaceful effort to secure shorter hours of work in the course of which the request was made. Meanwhile, during the time of these negotiations, some of the idle men had gone to other towns looking for work but were refused on the ground that they had been engaged in the troubles in Butte. This refusal was at the instigation of the Butte managers. The agreement, however, furnished the grounds for a resumption of work by the Colorado smelter which was taken advantage of and the works opened June 24."

The statement of the Mill and Smeltermen (with the exception of the agreement that the Colorado smelter employees were asked to sign, which was not at the time at hand) was submitted to the managements of each smelter to which the Butte & Boston replied as follows:

"Butte, Montana, November 21, 1901.

"Hon. J. A. Ferguson,

"Commissioner,

"Helena, Montana.

"Dear Sir:—

"I beg to acknowledge receipt of your letter of November 9th, with copy of statement of the Butte Mill and Smeltermen, relating to the shut-down of the smelting works of the Butte & Boston Company in May, 1901.

"To give a full detailed account of this matter would mean a very long statement and more than I wish to go into.

"The facts are that a demand had been made upon us to give eight hours to the yard men, machinists and machinists' helpers. Our machinists engaged in smelter work already had the eight-hour day. The machinists employed in a similar works in this district had walked out on a like demand. Our works closed down May 16, 1901, and resumed thirty days later, under the same conditions that were in force previous to the shut-down, except that we closed our general machine shop and it remains closed at this date, and we are having our work done elsewhere.

"Very respectfully,

(Signed)

"JOHN GILLIE, Supt."

The following reply was received from the Colorado Smelting and Mining Company:

"J. A. Ferguson,

"Commissioner,

"Helena, Montana.

"Dear Sir:—

"I beg to acknowledge the receipt of your favor of the 9th inst. enclosing an abstract of report of the smelter troubles in Butte last summer, and submitted to you in behalf of the Butte Mill and Smeltermen's Union.

"Their report goes into the matter at some length; but in some of its features it could hardly be termed absolutely correct. I can only say, however, that we did close our smelter down; and after a lapse of about two months we renewed operations on exactly the same basis as when the smelter closed down. This is the most important feature, as far as we are concerned; and I feel that it is hardly necessary to go into any further detail.

"I can only add that we regret very much that we considered it advisable, at that time, to close our works and thus throw so many men temporarily out of employment.

(Signed) "Very respectfully yours,

"R. F. PEARCE, Manager."

Because of a disagreement between the Boston & Montana Smelting Company at Great Falls on May 11, about 120 men were thrown out of employment for a few days. The cause of the trouble was the demand of the stone masons and bricklayers, employed on repairs at the smelter, for an eight-hour day. The matter was ended through a compromise by which the men received a concession of 10 hours pay for 9 hours work.

On August 17, 90 miners who were employed in the Whisky Gulch mines in Fergus county, refused to go to work on account of the poor quality of food furnished at the company boarding house. An attempt was made to operate the mines with other labor but this was not successful, and within a few days an agreement was reached by which the men were allowed to board where they pleased, and after certain changes were made in the company boarding house work was resumed.

October 22, 45 plumbers employed in Butte, went out on strike because of the refusal of their employers to grant an advance in their wages 50 cents per day. After being idle for two days the advance was granted and the men returned to work.

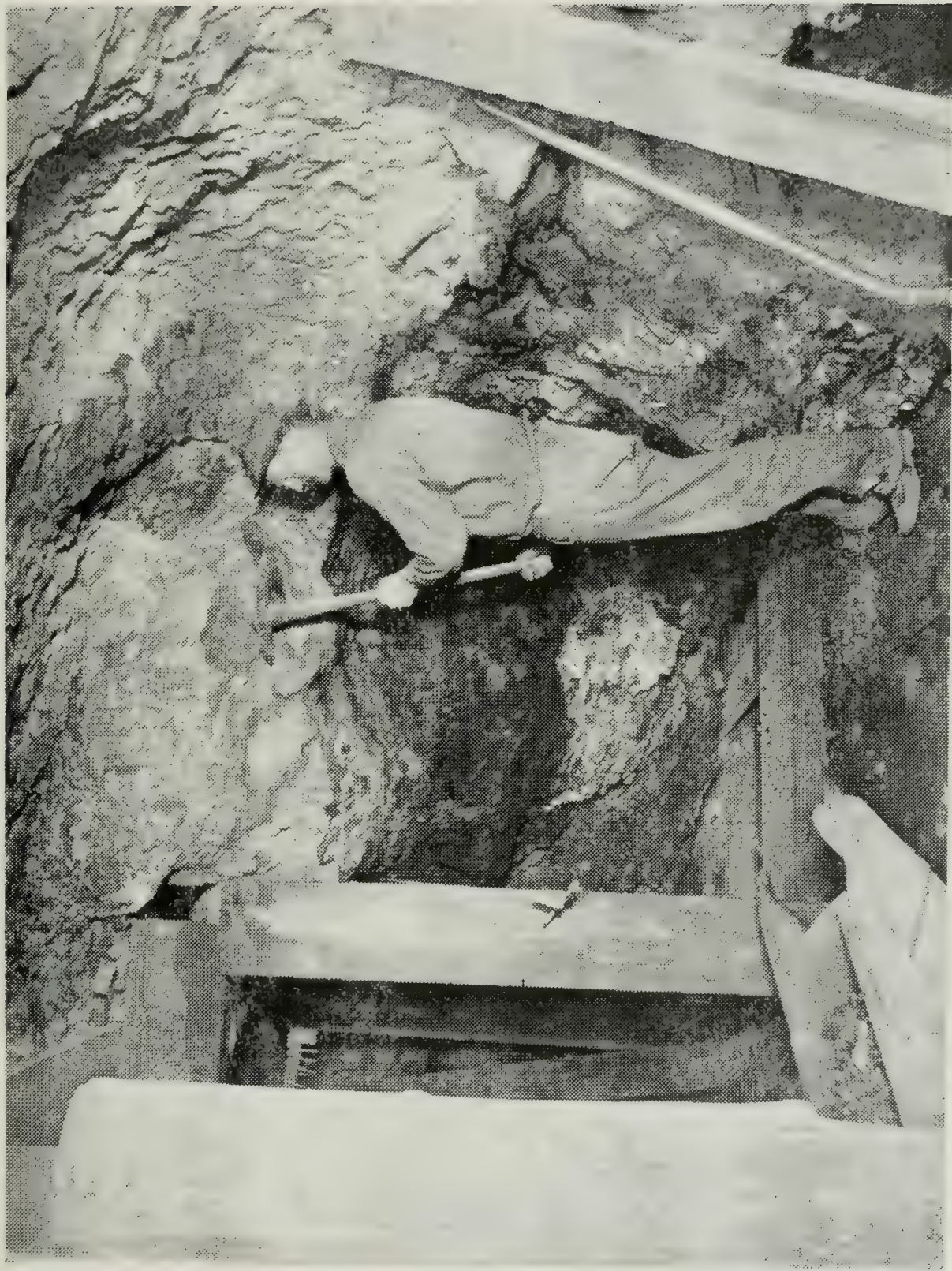
On December 2, a strike involving all the employees of the Clark's Fork Coal Company at Gebo took place, the main cause of the difficulty being the attempt of the company to work double shifts in some of the rooms which it claimed to be necessary in order to have coal on hand early in the morning. The miners claimed that this process materially reduced the output of each man and that the second shift would greatly benefit by taking out coal that had been broken down by the first shift. It was further claimed that the new system would compel the men to work in smoke for several hours and that in no other mine in the country was the two-shift plan in operation. The company proposed to inaugurate the plan in 7 of the 20 rooms of the workings but all of the men walked out. Friendly conferences were at once arranged and the plans for working double-shift were abandoned. In the final settlement the men also gained a reduction in house rent of \$1.50 a month, and now only pay \$5, where they formerly paid \$6.50, together with certain concessions for which they had long contended.

On December 24 the hack drivers of Butte struck for an advance of 50 cents a day, and, after being idle for 24 hours, their demands were granted.

STRIKES AND LOCKOUTS 1902.

The first difficulty of the year 1902 occurred in Anaconda on January 26, when the news carriers, who were without any organization, demanded an advance in wages. After being out three days a settlement was made whereby the wages, which had been \$10 a month, were increased to \$15 a month in winter and to \$12.50 a month in summer.

On February 8, 1902, the regular switch engine, doing duty in the yards of the Northern Pacific Railway at Missoula, was disabled and sent to the shops



AT WORK IN THE DEPTHS

for repairs about 7:45 P. M., but as no work was done upon this engine during the night it was not ready for service at 7 o'clock the next morning. A road engine was, therefore, sent into the yard to do switching which had not been put into condition for such service. The safety of the employees demands that such yard engines be equipped with foot-boards all around and that other precautions be taken. This action was also in violation of an agreement between the yard master and the switchmen which provided that road engines would not be used for yard work. The men demanded that the engine should be properly equipped for the service it was to perform and upon the refusal of the Superintendent the crew quit. Other men were called to take their places and they also refused to work with the engine as it was. Men were also brought from other places but refused to go to work when they learned of the condition of affairs. In the meantime several engineers refused to take out trains which were made up by incompetent men, or those who were not members of the switchmen's organization, and they were promptly discharged. Some others along the line of the road were also discharged for refusing to do work which was necessitated by the strike and out of the line of their regular duties. The difficulty seemed to be growing more and more serious until the afternoon of the 13th, when the superintendent sent for the men, and, in a three-hour interview, conceded to them every point for which they had contended. All the old men who had been discharged during the strike were reinstated without prejudice and an agreement made that in the future no engine would be used for switching that was not properly equipped. The conduct of the men who were concerned in this strike was of the very best and won for them the support and sympathy of all citizens. The most unfortunate circumstance of the trouble was the killing of a track man in the yard, which was unquestionably due to the attempt made to conduct the work without sufficient and competent help, and a properly equipped engine for yard work.

On the same date 40 men employed by the Montana Coal and Coke Company at Horr, went on strike against the attempt of the company to compel those who had contracts for drawing the coke ovens and loading cars, to clean up spillings and to heat the kilns without extra pay—work that had formerly been done by day men. This action resulted in closing the mines at Aldridge, where the coal is mined to supply the coke ovens at Horr. After eight days the men returned to work on the terms existing before the strike and all were reinstated in their old places without prejudice. The wages of day hands is \$2.50 a day, while the men on contract work make from \$2.10 to \$2.40 a day.

On March 9, a strike was ordered by the Switchmens' Union and the Brotherhood of Railway Trainmen at Missoula, owing to the fact that the trainmaster at that point had discharged the conductor and two brakemen who refused to take a train out of the Helena yard, claiming that they had been called out of their turn. This, the management admitted to be true, but claimed that the action was unavoidable and that no rule or agreement existed to the contrary. The trouble was brewing for 10 days before the strike and finally

culminated in an ultimatum that the men must be reinstated or their fellow-unionists would strike. This was refused and the strike followed, resulting in a complete tie-up of the division with the exception of the mail trains.

On March 16, a settlement was effected through a conference with Assistant General Manager Law, and a number of the strikers were put back to work, but the men were not successful in their demands, and many of those who went out claim to have been blacklisted.

On March 10, the carpenters employed on the construction of a depot at Alder, on the Ruby Valley branch of the Northern Pacific Railway, went on strike to enforce payment of their wages which they had not received for several months. As the action was against the contractors, and not against the railroad company, the latter brought in a gang of bridge carpenters and completed the building, the strikers being left without redress except through the courts.

March 29, the carpenters of Missoula became involved in a difficulty with the Big Blackfoot Milling Company at Bonner, over the employment of a man who was reported as opposed to the union. Six men left their work but, after two days, returned, pending the result of an investigation by the union. An amicable settlement was reached on April 11, the investigation resulting in the complete exoneration of the accused employee.

On Tuesday April 1, occurred the culmination of a disagreement of long standing among the members of Stationary Engineers Union of Butte, when 27 of their members employed as hoisting engineers at the Anaconda, Washoe and Parrot hoists walked out upon the refusal of the managements of these works to concede an advance of wages of one dollar a day to the "direct motion" hoisting engineers. The situation was extremely complicated from the fact that these men were not only working under a mutual agreement with the Butte Miners' Union, but were also held to be bound to continue work under an agreement which had been made between the Stationary Engineers Union and their employers whereby, for certain concessions, the engineers union agreed that its members should work for a period of two years at the rate of \$4.00 a day of eight hours and which had not yet expired. On the other hand, the strikers claimed that under the agreement, they were compelled to work for the same rate of wages as a pump man or engineer running a simple stationary engine, whereas their work required the highest degree of skill and was wearing in the extreme, thus justifying them in asking for the increase and in striking to obtain it, especially as they were in a minority in their union and had been opposed to the two-year agreement when it was adopted. So far as gaining the advance in wages is concerned this strike must be recorded as a failure, as the men failed in receiving the support of their own organization, and the Miners' Union as well. They seem, however, to have clearly established the fact that, as upon the skill, sobriety and carefulness of the hoisting engineer depends, in a great measure, the productivity of the mine, as well as the life and limb of the miner while being lowered into or hoisted out of the shaft, the responsibility of their positions justified the demand either for better pay or shorter hours.

The painters and paperhangers of Butte, made a demand for an increase in wages to take effect on April 1st, which the employers refused to pay and enforced their refusal by locking the men out. The difficulty was settled on April 13, the men receiving a substantial increase in wages and resuming work.

Twelve men employed upon the steel work used in the construction of the Cascade county court house at Great Falls, were called out by Federal Labor Union No. 18 of that city, on April 3. The disagreement arose over the scale of wages to be paid, the men who were working as common laborers and handling the steel on the ground, demanding the same pay and hours as the men who were engaged in putting the steel in place aloft. After being out about a week the matter was adjusted in a friendly manner through a conference between a committee of the union and the foreman in charge, and work was resumed, all the men being reinstated.

On April 3, the State Coal Mine Inspector issued the following notice:

"Rocky Fork Coal Company,
"Red Lodge, Montana.

"Gentlemen:—After carefully considering the matter I deem it necessary for me to ask your company to stop hoisting men on your slope as is the present custom. This order will be effective on and after April 10.

"HOWARD F. WELCH,
"State Inspector of Coal Mines."

The posting of this notice by the mine manager caused a strike of all the men employed in and about the mines, and a total cessation of work. The reason for issuing the order given by the inspector was, that the practice of the men in riding up the slope was to crowd on more men than was safe, thus endangering the lives of the miners. The trouble lasted eight days when it was adjusted in a satisfactory manner to all concerned, the order discontinuing the man trip rescinded, and the following rules governing the hoisting of men adopted: "1st. That the man trip shall consist of no more than six cars and that no more than eight men shall ride on any car. 2nd. That the cars constituting the man-trip must be connected by a safety chain which shall be connected with the hoisting cable at least three feet from the coupling of the first car, and extending over the cars, connecting with the draw-bar of the last car. 3d. All miners working in the mines of this company must remain in the entries at least one hundred feet distant from the slope until the time appointed for the man-trip. 4th. The cable, chain, cars and couplings shall be examined by some responsible man appointed by the company before men are hoisted. 5th. Violation of any section of this agreement, either by the men or company, will subject the offender to the full penalty of the law."

Undoubtedly the most serious difficulty which has occurred in Montana in recent years was the strike of the employees of the American Smelting and Refining Company, about 600 in number, at the East Helena plant on April 28. Relations between the men and the company had been strained ever since May, 1901, when the eight-hour law went into effect, and were continually growing worse through the policy of the company which was discharging

old and new employees alike for joining a union. During the winter months the men were restless but refrained from any serious action. With the advent of spring and the consequent ability to secure employment in other lines, they began to join the union in large numbers, and the company retaliated by discharging every man who was known to have done so. Finally, seeing that they had but the alternative of striking or abandoning their union, the men, union and non-union alike, decided to strike, and left the smelter in a body. Efforts were at once made to bring about a conference between the opposing factions but without success, the company declaring that it would not, under any circumstances, employ a union man, nor even tolerate the formation of a union in East Helena and announced its determination to close the smelter for good. Accordingly the fires were drawn and a feeling of gloom settled upon the community. There were those, however, who did not give up hope of a settlement and they finally succeeded in arranging for a series of conferences between the representatives of the men and the company. These meetings finally resulted in a compromise being effected and on July 7, after having been out 10 weeks, the smelter was opened and the men returned to work.

The following communications and "Notice to Former Employees" were the basis upon which the settlement was made:

"May 16, 1902.

"Committee of Former Employees,

"Messrs. J. G. Brandenburg,

"Ole Rosengren,

"Jas. McCormick,

"M. O'Rourke,

"Joe Starika,

"Gentlemen:

"I beg to acknowledge receipt of your communication of the 15th inst. reading as follows:

"East Helena, Montana, May 15, 1902.

"C. W. Whitley,

"Manager East Helena Smelting Works.

"Sir:—The undersigned, who have been delegated as a committee from your former employees, propose to you that the existing strike will be declared off and the men will resume work on demand, if you will re-employ the old men at the present wage scale, giving former employees preference in hiring men, and if you will give the assurance that no discrimination shall be shown against members of organized labor in the present or future.

"The employees on their part agree that if this is done, no strike shall be declared on account of wages or hours during the period ending May 1, 1903.

"Respectfully submitted,

"This company has made all arrangements necessary for shutting down this plant for an indefinite length of time, but the attitude of the citizens and business men of East Helena, and those throughout the state, as well as the attitude of our former employees, leads me to believe that our New York officials, the Executive Committee, will consider favorably your proposition as former employees of the company.

"I will agree to telegraph your proposition with my recommendation, and

have great hopes that I shall receive authority to accept and enter into such agreement by to-morrow evening, when I will notify your committee.

(Signed,)

"Yours truly,

"C. W. WHITLEY, Manager."

"East Helena, July 7, 1902.

"Notice to Former Employees:

"The influence brought to bear upon this company by Ex-Gov. Hauser, as representing the business community of Helena and vicinity, has decided this company to make an offer to all former employees to resume work immediately. This proposition is made, notwithstanding the fact that the company had decided to close down this plant indefinitely. Such men as wish to return to work will report at 7 o'clock to-morrow morning, July 8, at time keeper's office, where they will be re-employed as fast as they can be used at the old scale of wages, and will be expected to continue to work at the old scale of wages for one year from May 1st, 1902. All men will be expected to sign the following agreement:

"I, the undersigned, desire to return to work at the East Helena Plant of the American Smelting and Refining Company as soon as possible, understanding that the old employees will not be discriminated against, and will be given preference, and I agree to accept the old scale of wages until May 1st, 1903, if your company desire to employ me for that length of time."

On May 1, the Teamsters Union of Butte put into effect an eight-hour day for all teamsters. The men employed by the coal and ice dealers struck to enforce their demands and, after six days, were successful, the dealers granting the shorter hours without decrease of pay, but decided to advance the cost of coal and ice to the consumer. Among the lumber yards and planing mills of the city the trouble developed into a lockout, which involved all the employees of these establishments and lasted for a period of six weeks, being finally settled on June 11, through an agreement which was reached at a conference between the owners and committees representing the carpenters, teamsters and workingmen's unions. Building operations in Butte were nearly suspended during this trouble and its amicable adjustment was the cause of much good feeling. Under the agreement the men returned to work at practically the same terms as existed before May 1.

May 20, the Butte Brewery Workers' Union, which has jurisdiction over all the brewery employees in the State, and had been for some time in conference with the Master Brewers Association over an advance in wages and certain trade rules, ordered a strike in several breweries in the State to enforce their demands. It was necessary for the men to go out in only one city, the brewers in all others signing the scale under protest. In Great Falls the men walked out of the two breweries but inside of 10 days the scale was signed by these proprietors, also, and the men returned to work.

On the same day, May 20, a difficulty over hours and wages between the team owners of Great Falls, and teamsters in their employ, and which had been under discussion for some time, finally developed into a strike of the teamsters and business in that line was seriously discommoded. The owners desired that a certain part of the men who were engaged in hauling coal or ice, or in the transfer business, should work nine hours, while they were willing to concede eight hours for the others. The union insisted on eight hours alike

for all. The novel situation was disclosed in this trouble of both parties involved having a labor organization, the team owners being members of Team Owners Union, and the teamsters being members of Federal Labor Union No. 18. The value of organization was quickly shown for, after being out only one day, an agreement was reached through a compromise whereby both parties were satisfied, the owners granting an increase of wages to men who continued to work nine hours, and the eight hour scale to all others.

On June 8, the boilermakers employed in the Great Northern Railway shops at Great Falls, and also at Havre, in response to a general movement of their organization for an advance in wages and shorter hours, struck. Fifteen men were involved in Great Falls, seven at Havre, and a number at other places. A compromise was effected through the officials of the road and the general officers of the organization in conference at St. Paul by which the men received a substantial increase in wages and work was resumed on July 12.

On June 24, the machinists employed in the Great Northern shops at Great Falls to the number of 16 and, accompanied by 34 other workmen, struck for an advance of wages to 40 cents an hour for 9 hours' work, in place of \$3.25 for 10 hours, and two days later their action was followed by the machinists in the shops at Havre, numbering 30. In all about 100 men were involved in this difficulty which was settled from St. Paul after the men had been out nearly seven weeks, both sides making concessions, and the men returning to work.

At a number of woolgrowers conventions held during the early part of the year, the members of these associations bound themselves not to pay more than a certain specified price for shearing during the season. This action, taken without any consultation with the shearers, led to a number of strikes during the shearing season, the men in all cases demanding an advance over the scale set by the owners in convention with varying results. In some cases they were successful in securing a slight advance, but in others new men were taken on and the strikers left the vicinity, being unable to get employment after having gone on strike. The final result was the formation of a shearers union which will endeavor to have a say about wages in the future.

In Bozeman on July 15, the bricklayers employed on the new high school building struck for a reduction in hours from 10 to 9 with the same pay. The men had no union and, as the contractors were in a hurry to complete the work, they offered eleven hours pay for ten hours work, which was accepted by most of the men, and work was resumed at once.

July 25, seventeen bridge carpenters employed by the Northern Pacific Railway struck at Carlton for an advance of 50 cents a day, but without success, as their places were filled from other crews and the work completed.

On August 2, the employees of the Montana Coal and Coke Company struck to enforce a scale of wages, together with certain rules governing their work, and the employment of non-union men. Through the intervention of a committee from the Aldridge Miners' Union and others, an agreement was reached by which the men returned to work upon the following basis:

"Scale of wages agreed upon by and between the Montana Coal and Coke Company at Horr, Montana, and employees at coke ovens situated at Horr, Montana, to be effective for a period of one year from date of acceptance: Locomotive engineer, \$3.00 per day; extractor engineer, \$2.50 per day; lorrie men, \$2.50 per day; coal levelers, \$2.75 per day; draughters, \$2.75 per day; men forking coke from extractor, \$2.50 per day; bunker men, \$2.50 per day; cart boys, \$2.00 per day; coke drawers, 83 1-3 cents per oven; coke loaders, 15 cents per ton; laborers, \$2.00 per day. Ten hours to constitute a days work.

"Company reserves the right to dismiss any employee for willful neglect of duty. Where men are capable, seniority will govern advancement and promotion. At any time employees desire holiday same can be arranged by employees giving company 10 days notice in advance of date of holiday to prepare for same.

"The above accepted August 12, 1902.

"THE MONTANA COAL AND COKE CO.

"H. G. MERRY,

"General Manager."

"EXECUTIVE COMMITTEE HERR MINERS' UNION."

In Great Falls on August 11, the men employed in constructing a sewer refused to work longer because the contractor was not paying the scale of wages adopted by their union, but after being out two days the matter was arranged and the men resumed work, the contractor agreeing to the scale.

Fifty-one engineers and switchmen employed on what is called the "air line" at the new smelter in Anaconda, struck on August 13, to enforce a demand for higher wages. The men employed in running compressed air engines had been receiving \$2 a day and the switchmen were receiving \$2.50 a day. Their demands were for \$2.50 and \$3.00 a day, respectively. During the strike the men were organized into a union and at a meeting of this body held on August 19, the strike was declared off. Some of the men returned to work under the old conditions but a large number left town to seek work elsewhere.

On September 3, sixty carpenters employed at the Washoe smelters in Anaconda, left their work upon the refusal of the manager to comply with their request for an eight-hour day, which they claimed under the law. The president of the company stated that it was impossible to grant the request of the men at this time and that they could do as they pleased about working at the same hours. After being out until September 29, the men returned to work under a compromise whereby those men who were employed in the smelter received an eight-hour day, while those who work outside are to work nine hours. This arrangement was generally very satisfactory.

The big shops of the Northern Pacific Railway at Livingston, were the scene of a strike on September 3, when the machinists employed there went out to compel the reinstatement of one of their number who had been discharged. The trouble lasted until September 16, when it was adjusted through the efforts of Vice-President Wilson of the International Association of Machinists, and, with the exception of 8 who refused to accept his decision, all the men returned to work on that date. About 200 men were involved.

On September 29, twelve members of the Electrical Workers Union at Great Falls, employed by the Rocky Mountain Bell Telephone Company,

struck in conjunction with other employees throughout Idaho and Utah to enforce recognition of their union and a shorter day. A settlement was effected on October 3, the company granting full recognition of the union and agreeing to the following scale:

Toll Line Foreman, \$80 per month and expenses; sub-foremen, \$70 per month and expenses; linemen, \$65 per month and expenses. The latter to receive \$2 a day and expenses if employed less than a full month.

Day wages in the city: sub-foremen, \$3.51, first-class linemen, \$3.24; second - class linemen, \$3; third - class linemen, \$2.50. One first - class lineman will be allowed for every exchange with 300 subscribers; nine hours to constitute a day's work in all cases. Time and a-half to be allowed for all overtime, including Sundays and holidays, and the union is fully recognized.

On October 15, twenty girls employed at the garment factory in Helena, struck over a misunderstanding regarding the wage scale, but after a conference, a portion of the work was taken from the overall makers and work was resumed the next day.

On October 16 the plasterers working on the women's building at the State University, declared a strike after demanding the discharge of a fellow employee who had a union card from an outside organization and refused to pay the initiation fee demanded by the rules of the Missoula union. The trouble was amicably settled the same evening, the plasterers withdrawing from the local union to which they had formerly belonged and forming a new union under the Operative Plasterers' Association.

On the same day the manager of the Kearsage mine, at Virginia City, locked out about forty miners who demanded the discharge of the Chinese cook. This difficulty was amicably settled at a conference between the owner and a committee from the union assisted by the president of the Butte Miners' Union, it being agreed that the Chinese should be replaced by white cooks and full recognition of the union granted.

This was the final disagreement of the year and at this writing, November 1, there is not an active labor difficulty in the State.

SUMMARY OF STRIKES AND LOCKOUTS.

The whole number of strikes and lockouts in 1901 was twenty-four of which nine were won, eleven were compromised, three were lost and one is still pending. In 1902 there were thirty-five strikes and lockouts, of which sixteen were won, twelve were compromised and seven were lost.

These were the active difficulties but it is manifestly impossible to give any account of the cases of successful intervention of the labor organizations against proposed reductions, enforcement of unjust trade rules—in fact, the whole internal economy of the unions, or the friendly acts of kindness and courtesy upon the part of the employers and managers and the voluntary concessions, even of advances in wages, that were so quietly done by both parties that the public were unaware of them. Nor can record be made of the hundreds of cases of protection to the widow and orphan, the weary watches with the sick, and the multitude of fraternal offices performed for each other by the hosts of union men and women of Montana. These are recorded in Another Book.

SHORTER HOURS.

To the stationary engineers of Montana belong the honor of the first trade to secure, through legislative enactment, an eight-hour day for members of their craft. A few other trades, notably the cigarmakers, had established the short hour system previous to this, but it was entirely the result of the action of the general organization of the trade and maintained as a trade regulation. The law providing for eight hours as a day's work for stationary engineers in all places where 15 or more men were employed underground, was approved on February 16, 1893, and became of full force and effect May 1 of the same year. It has never been amended and is in full operation at present. Its passage aroused a general interest in the short-hour movement and while no further legislation was secured until the passage of the eight-hour law for men employed in mines, mills and smelters in 1901, many of the trades organizations secured a reduction of hours during the intervening years through the efforts of their respective unions..

A great factor in this movement was the Montana State Trades and Labor Council organized in the city of Helena in May, 1895. Through this organization which brought together in a representative body every organization in the State, except the railroad employees, valuable assistance was rendered to affiliated local unions in all efforts to obtain a reduction of hours, probably the most remarkable success being obtained for the lumbermen employed in Ravalli, Missoula and Flathead counties.

Until the year 1895 the hours of labor in this great industry had almost universally been eleven hours a day, the only exceptions being in certain mills and logging camps where eleven and a-half and even twelve hours was the rule. During the "drive" it was customary to work 16 and even 18 hours out of 24 in icy water. In 1895, however, the men organized unions and secured a reduction to a universal ten-hour day, and in some instances there was also a considerable increase in wages.

It is a remarkable fact that in one large sawmill employing about 200 men, more lumber was cut with practically the identical crew, in ten hours than was cut during the previous season at eleven hours. So satisfactory, indeed, did the shorter hours system prove that, in the fall of 1902, after 6 years trial, the employers themselves granted a reduction to 9 hours in all sawmills and logging camps in Missoula and Ravalli counties.

It is also worthy of mention that the successful efforts of the Montana lumberman, in reducing their hours of labor, influenced their brother craftsmen in Idaho, Oregon and Washington to such an extent that the eleven-hour system was abolished in those States and that now the ten-hour rule obtains there. Wages have also steadily increased since the unions were formed and the general condition of these employees has been greatly improved. The hours

in the building trades have also been reduced in many cases to 8 but there are a large number of places where the trades have acted with the common laborers in securing a universal nine-hour day, being content to sacrifice a part of their own wishes to help their less fortunate fellows.

So general has the short-hour movement been that it can safely be said that not less than 10,000 employees in the State are working from 1 to 5 hours less a day than they were in 1895, and in most cases without any corresponding reduction in wages. The most prominent reduction through legislation was gained through the action of the Seventh Legislative Assembly in 1901, which passed a law limiting the hours of labor in mines, mills and smelters to eight a day. This law became operative on May 1, 1901, but the shorter day had been granted by the large mining and smelting companies some months previous to that date. There was some fear among the workmen that an effort would be made to repeal or declare the law unconstitutional, but that feeling has been entirely removed through statements by all the leading mining companies that the eight-hour system had come to stay, and that it would be continued even should the law for any reason be abrogated. As to the actual workings of the law, extracts from a number of letters received from employees in response to inquiries sent out from the Bureau are given.

LETTERS FROM EMPLOYEES RELATING TO EIGHT-HOUR LAW.

A hoisting engineer in Butte writes: "The law is all right if its provisions were abided by. Its beneficent effects are noted more among the mill and smeltermen and smelter employees, and the artisans and top men employed about the mines, than among the miners themselves. In trying to evade the law, the mining companies and the philanthropists are working hard to establish a new custom, namely, that of making a miner's "days work" begin when he gets to his place underground, something never heard of in the mining history of the world. The difference in the amount of work done by the same number of men, under both systems, is not at all perceptible around the mines."

An employee of the Butte Reduction Works writes: "Twelve more men are now employed in this department than were required before the law was passed. There is very little more work required of each man. Forty-two men on three shifts now do the work of thirty men on twelve-hour shifts. Nine of the forty-two men were reduced to \$3 a day. The others still receive \$3.50 a day. The eight-hour law is having a very good effect, but is not being lived up to as it should be."

The letter of a Butte miner seems to express a very wide spread opinion of this numerous class of employees. He says: "Of course the miners are well pleased with the recognition of the short-hour principle. In the practical working of the law, however, the miner, by a change in working rules which compels him to both enter and leave the mine on his own time does not receive all the benefits the law contemplates. Still it was a step in the right direction, and we hope matters will be so arranged between the men and the managers that the men will realize to the highest degree the advantages of this progressive measure. Contrary to the expectations of many people,

there were very few men added to the working forces of the mines as a result of the law."

Of the conditions at Granite the miners write: "There are a few more men employed now than formerly, and more work is required of each man. The wages remain the same, \$3.50 per day. The working rules were changed so that we now go down in the mine at twenty minutes to 7, take only a half-hour for dinner, and come up at half past 4, making nearly nine hours underground. The present law is a good one but it could be made better by providing for only eight hours underground."

Letters from Winston say in substance: "The change in the law has not made any change in the number of men employed, and the wages are the same. In some mines more work is required than formerly. There is a decided violation of the law in one of the mines, as the men are fully nine hours at work underground. (This property is now closed. Commissioner.) The only change we can see is, that we are required to be in our places ready to work on time, and working the full eight hours in mining; while under the old rule we drew our candles after the whistle blew and went in on company time. Now we have to draw candles twenty minutes to time morning and noon, and have twenty minutes in which to get to our places. So far as we have been able to observe, the law is a decided benefit to the miners. It gives the mine more time to cool off and for the smoke and gas to get out, and it also gives the miner more time out in the fresh air, and for reading, recreation and general improvement. We also think it to the companies' advancement, as any man can and will do more work with good air and when he is feeling well, than he could under the former conditions. We think the new law will be adjusted in time so that it will be more beneficial than now."

Many replies from Great Falls were received, one of which says: "There was a change in the working rules that reduced the time for noon lunch from thirty minutes to twenty minutes. The eight-hour law was a blessing to men who had to work eleven hours day shift and thirteen hours night shift, at a two weeks change. We can now attend to our outside business, where before we had to employ some one else to do so, or lay off. The general health of the men is much better than it was before the change."

Another writes: "No new men were employed in this department. There was one man taken out of each crew of each twelve-hour shift to make a third shift, and the men have to do nearly one-third more work than formerly. There was no reduction in wages. I think that it is a very good law, one that should have been in force in all trades and in all countries years ago. No man, woman or child should be compelled to work half of their lives. They should have at least one-third of it for their pleasure. A man working twelve hours a day has little time for anything else, and will soon get so that he does not care. I believe that all of the men here are well satisfied with the law, and that the most of them would look for some other kind of employment if they had to return to the twelve-hour system."

Still another Great Falls man says: "I think it is the best thing that ever happened. The company seems to be satisfied, for we have heard of nothing to the contrary. We know it is a benefit to ourselves and to all the mer-

chants. About one-third more men are employed and there is much less laying off on account of poor health."

An employee of the East Helena smelter writes: "The new law necessitated the employment of about thirty-four new men. There was a reduction of wages in all departments. The force on the charge floor was reduced from thirty-three men to twenty-four men, and these men have to do the work done by the former crew. The eight-hour law is the best law that ever passed the Legislature of Montana for the men in smelters and mills where ore is treated. These places are very unhealthy for men to work in on account of the smoke, gas and dust which arises from the burning charges. Already the eight-hour system shows its benefit. While we were working twelve hours St. Peter's hospital was filled to its utmost capacity with smelter patients, who were suffering from lead colic, and lead rheumatism, or other diseases caused by the impure air in the smelter. Since the law took effect there is a great difference, hardly any complaining of sickness and very few going to the hospital."

TABLE SHOWING REDUCTION IN MEN AND WAGES ON THE CHARGE FLOOR.

Number of Employees under the former Twelve-hour Shift.		Number of Employees under the Present Eight-hour Shift.	
	Wages		Wages
8 slag wheelers	\$2 50	6 slag wheelers	\$2 20
7 on bed ore	2 50	5 on bed ore	2 20
3 on cooler	2 40	2 on cooler	2 10
2 cooler wheelers	2 50	2 cooler wheelers	2 20
4 coke unloaders	2 50	2 coke unloaders	2 20
2 coke wheelers	2 50	1 coke wheeler	2 20
1 on scrap iron	2 40	1 on scrap iron	2 10
2 pit dumpers	3 00	2 pit dumpers	2 60
3 feeders	3 00	2 feeders	2 60
1 hoist man	3 50	1 hoist man	2 90

The following letters are from men not working for wages, but who are engaged in occupations affected by the eight-hour law.

"I think the eight-hour law is a good thing for the workingmen and no disadvantage for the mine owner, as the men will work harder and accomplish as much work in eight hours as they would in ten or twelve, for the simple reason that a man gets more rest and when he goes to work he feels more like it; not only that, but eight hours is long enough for any person to work underground, especially where the air is bad or it is wet. I take notice that we accomplish as much now in eight hours as we did in ten. I do not expect to work for wages again, but if the law was to be voted upon at any time, I would vote for eight hours to be a day's work in all branches of labor."

Another writes: "The law as it stands to-day is defective in a few instances. While I thoroughly uphold an eight-hour day for nearly all underground labor, I cannot say that the law is just in wet crushing mills at the same price for labor as before. In large dividend-paying mines, like a great many of the mines in Butte, eight hours is sufficient for any one to work. On prospects the law is an imposition on owners, because many of them have to borrow money to carry on development work; nor can any one on a small seam of ore accomplish as much in eight as in ten hours. If the work could

be graded according to the condition of the mine, I am inclined to the belief that it would be more satisfactory to the small owner and prospector."

The movement for shorter hours has also extended to the mercantile houses and in every city and many of the smaller towns 6 o'clock closing is the rule. There has been no effort, however, to establish a weekly half-holiday. Clerks generally begin work at from 7 to 9 in the morning and have an hour for dinner, except in drug stores where very long hours are still the rule. An attempt was made to obtain some information as to the regulation of hours by law for drug clerks in other states but the results were not at all satisfactory. Considering the responsibility placed upon them, this class of employees is, in most cases, underpaid and over-worked. New York is the only state that has a law regulating the hours of drug clerks although it has been agitated in a number of others, and all persons consulted agreed that some action in this direction was advisable and some regarded it necessary.

It is very evident that Montana is well to the front upon this question. The movement has made rapid strides since its inception and there has been but one instance of a return to long hours after the union had succeeded in securing the eight-hour day, which was later restored by the law. Indeed, so universal is the sentiment in favor of shorter hours that it seems certain to become general in all branches of industry while if there is any danger of the movement being retarded it will arise from attempts to force its adoption too rapidly. A change in this direction means a rearrangement of conditions in many cases so sweeping as to require great care. Its recognition by the large employers of labor reduces to a minimum the opposition to its general introduction and holds out the brightest hopes for the future. Wise and conservative action alone is necessary to bring about its adoption throughout the State.

VIOLETIONS OF THE EIGHT-HOUR LAW.

But one case of violation of the eight-hour law ever reached the courts, and this occurred in Flathead county where a complaint was filed against Mr. John Branigan as manager of a mining company, who, upon trial in a justice's court was fined \$150. Upon his appeal to the district court arrangements were made through the office of the Attorney General for proper defense of the law, it having been intimated that its constitutionality would be attacked. When the case was called, however, it was found that this idea had been abandoned and that Mr. Branigan was then complying with the law in every respect, whereupon the matter was settled by the payment of a fine.

Complaints of violation in other localities have been made but, as above stated, they have never reached the courts.

COMPANY STORE LAW.

The Seventh Legislative Assembly passed what is known as the Company Store, or the Lawful Money Bill. This legislation was made necessary owing to the fact that it had become customary for many corporations to maintain mercantile establishments and department stores at which their employees were compelled to trade and in whose offices alone employees checks for wages could be cashed. The bill very properly regulated this condition and now the employees can trade where they please and their pay-checks are negotiable paper anywhere. There was one deplorable condition, however, which the bill did not rectify, although it purported to do so, and that was the abolition of time-checks. The mandatory provision of the law that all wages were payable in cash or check, was so modified by amendment as to exclude from this provision, ranchers, lumber and mining camps where there is no bank, or a store other than that owned by the employer. The result of that amendment is that time-checks are still in common use throughout the State, and many workmen, after months of hard labor find themselves with nothing but a worthless time-check to show for it. It is also very common for the camp superintendent to have a city confederate who, as a very special accommodation to the holder of the time-check, is willing to oblige him by cashing the check at from 25 to 50 per cent discount.

It is true that this practice is not so prevalent as in former years but complaints and demands for redress have been made to this office. The law should be changed so that payment of wages in cash or check would be mandatory in all cases, at the same time allowing the bona fide lumber camps or isolated mines to carry a stock of necessities to supply the wants of their employees. The absolutely helpless condition of men holding a worthless time-check, unable to bring action because they lack the means, hungry, despondent and without friends, appeals strongly to a sense of justice.

By striking out all that part of the law in the first section after the word provided and inserting therein the following a great benefit would be conferred and numerous cases of rank injustice prevented: "This shall not be construed as prohibiting any saw mill, logging or mining company, operating in an isolated locality, from maintaining a stock of goods for the purpose of supplying the necessities of their employees."

VIOLATIONS OF COMPANY STORE LAW.

But one case of all the violations reported was ever tried before a court and this was closely associated with the violation of the eight-hour law in Flathead county, warrants in three cases being issued against Mr. John Branigan. These cases were tried in a justice court and a fine of \$150 in each case was imposed. These were included in the case with the eight-hour law in the district court and the whole matter was settled by the defendant pleading guilty to one charge, the others being withdrawn and the payment of a fine of \$100.

SANITATION.

The sanitary conditions of the working people of Montana, while not perfect by any means, are rapidly improving. Thanks in some measure to the eight-hour law, and the formation of unions among the various industries where, previously, absolutely no sanitary precautions were observed. There is still room for vast improvement. The typhoid epidemic which prevailed in some of the lumber camps in Missoula county in 1901 was simply horrible, and insofar as it was preventable, absolutely criminal. There can be no excuse in the enlightened present for such a condition as obtained in a lumber camp on Nine Mile, during the year.

SPOTTED FEVER AND TYPHOID.

The subjoined communications which passed between the Secretary of the State Board of Health and the Commissioner of the Bureau explain themselves:

"Dr. A. F. Longeway,

"Secretary State Board of Health, Great Falls, Mont.

"My Dear Doctor:—I inclose a clipping from today's Butte Miner, in which is the first intimation this season of spotted fever. If you could communicate with Doctor McCullough, of Missoula, he would doubtless keep you advised of the progress of this case. I am very anxious to get some definite information about this disease and hope to be able to do so this spring.

"I feel obliged also to call your attention to the typhoid epidemics in some of the lumber camps of Missoula county and, in order that you may realize the conditions that exist there, I take the liberty of sending you some of the facts as they have been reported to this office.

"At Nine Mile, at the lumber camp of McKeen & McQuarrie, the stable, pig pen and cookhouse were arranged along the creek. Flies bred profusely at the stable and pig pen and then swarmed into the kitchen and cookhouse, which was built of green lumber, that in shrinking left cracks between the boards. There was nothing at the doors or windows to keep flies out, and no partition between the kitchen and the place where the men sat down to eat. As a result of these conditions the food, both in the process of cooking and after it was placed on the tables, was literally covered with swarms of flies direct from the filth of the stables and the pig pens, which filth they carried in sufficient quantities to poison the food. The consequence of this condition of affairs was that out of sixty-eight men employed at the camp sixty-four were taken with typhoid fever. Many of them died, and it is also a remarkable fact that both of the proprietors took the fever and, in spite of all care, lost their lives.

"It should also be stated that in a camp on the same creek, but a very short distance from McKeen & Quarrie's, proper steps were taken to keep the flies out of the kitchen and cookhouse, and not a single case of fever developed.

"I have a report from another place, which states that when the camp was abandoned in the fall after the season's work was done, the water barrel which was connected with the stove and from which all the hot water

used for cooking purposes was taken, contained in its bottom nearly ten inches of dead flies and bugs. The fever was prevalent at this place among the men employed, and a large number died.

"Knowing that these conditions prevail, and believing that much if not all of the typhoid occurring year after year in these camps is due to a lack of common sanitary precautions, and is therefore preventable, I invite your co-operation and assistance in bringing about a change and will welcome any suggestions you may offer, assuring you that I will do everything in my power to aid the work.

"Very respectfully,

"J. A. FERGUSON,

"Commissioner."

Doctor Longeway, in reply, said:

"Hon. J. A. Ferguson,

"Commissioner, Helena, Mont.

"Dear Sir:—Your communication of the fifteenth instant regarding spotted fever and sanitary matters to hand; they will receive our careful attention.

"I am in correspondence with parties in Missoula and the Bitter Root valley asking for information upon the first appearance of the disease, stating that it is the intention of the board to use every effort to carry on the investigation instituted last year."

"Very respectfully,

"A. F. LONGEWAY,

"Secretary State Board of Health."

The publicity thus given to these conditions aroused the local boards of health and during the summer of 1902 there was a marked improvement, both the State and county boards being ready at all times to render proper aid.

The "spotted fever" referred to is a vexed question. At the request of a number of property owners and members of labor organizations in the locality where this disease has been prevalent for many years, the Commissioner called the attention of the State Board of Health to the matter with the result that the Secretary of the Board, Dr. Longeway, Dr. Strain, of Great Falls; Professor Traphagen of Bozeman and Prof. Starz, State Bacteriologist, made an investigation which covered a period of about one week. Dr. Longeway remained longer and it was finally decided to secure the services of two eminent gentlemen from the East who could spend more time on the ground than it was possible for the others to do. Accordingly Dr. L. B. Wilson and Dr. William M. Chowning, specialists from the University of Minnesota, were engaged to do the work and, after a careful investigation, made a statement which is given in full in the report of the State Board of Health, which may be obtained from the Secretary, Dr. A. F. Longeway, Great Falls. Some of the findings are here quoted:

"General Considerations.

"In studying the etiology of this disease the following facts have appeared to be of the most importance:

"1. The disease is definitely limited in locality, being sharply cut off from the eastern side of the valley by the Bitter Root river.

"2. It is confined entirely to one season of the year, namely, from March to July.

"3. It attacks alike patients of any age and either sex.

"4. All the symptoms and lesions indicate that the disease is due to a specific infection.

"5. There is not even a suspicion of its ever having been transferred directly from one human being to another, except in one instance, in which an infant, born while the mother was suffering from the disease, died four days later with marked purpura.

"6. In no instance have two or more persons with the same food or water supply been stricken with the disease within a short time of each other.

"7. There are no symptoms or lesions which point to the digestive tract, respiratory or genito-urinary organs as the avenue of infection.

"8. In all the cases examined by the writers there were small wounds of the skin, said to have been made by the bites of ticks. In nine of the cases this history was definite and positive. In one—a child—no history of tick bites was obtained, though the skin wounds were present, and ticks were numerous about the premises where the child had been playing. In three of the cases there was a history of a single severe bite, two, three and five days respectively before the onset of symptoms.

"Mode of Infection.

"Since there is no suspicion of 'spotted fever' ever having been transferred from man to man, and since there is no symptomatic or post mortem evidence of entrance of the disease, either by way of the digestive tract, respiratory or genito-urinary systems, the writers were led to examine the skin for evidence of direct inoculation by the bite of some temporarily parasitic animal. As has been noted above, in each case under observation, evidence of tick bites was present. But it is true that in the locality in which the cases occur many persons in the spring of the year are bitten by ticks and yet show no symptoms of 'spotted fever.' However, the following facts would seem to suggest the hypothesis that the disease is conveyed to man by means of this insect:

"1. Ticks are known to appear in the spring as soon as the snow melts from the sunny exposures; in other words, in the Bitter Root Valley as early as February 15. They are, however, chilled and inactive until the latter part of March or first of April, and do not become very numerous until the latter part of April. In relation to this, scattered cases of 'spotted fever' appear during the latter part of March, and first of April, and are most numerous during May and June.

"2. Ticks become less numerous about the middle of June and finally disappear about the middle of July. In connection with this it should be noted that cases of 'spotted fever' become less and less numerous from the middle of June to the middle of July, after the twentieth of which month no cases have been observed.

"3. The occurrence of 'spotted fever' in isolated cases in a region sharply limited on one side by a river, would indicate the conveyance of the germ to man (if by any animal whatsoever) by a temporarily parasitic animal which travels slowly and not widely, and which is not carried far by the wind, etc. The tick answers this description.

"4. All hematozoa of warm blooded animals, of which the life cycle is now known, pass, at least, one phase of their development within the body of some host (usually an insect or arachnid) other than the one whose blood cells they invade. This is probably also true of the hematozoon of 'spotted fever.'

"5. The malarial organism, the hematozoon which in man most nearly resembles that of spotted fever, is conveyed to man by the bite of an insect. The organism of Texas fever in cattle, which is apparently a very close relative of the germ causing spotted fever, is conveyed to cattle through the bite of ticks. It is, perhaps, unnecessary to note that of the many genera of mosquitos only one carries the malarial organism to man and of the many genera of ticks only one carries the Texas fever organism to cattle; further, that even in these specific genera by no means all of the individuals are affected by the pathogenic parasite.

"6. There are at least three (probably more) species of ticks within the region in which 'spotted fever' occurs, and the specific selection noted under No. 5 may apply to these.

"7. All of the patients, eleven, coming under observation during this investigation, had been bitten by ticks. In three cases a history was given of a single severe tick bite, two, three and five days respectively before the onset of the disease.

"8. There is apparently no other insect, arachnid or other biting creature within the infected locality which would fulfill the conditions indicated in the above outline as does the tick. For instance, it may be noted that mosquitos do not appear until a later date than that on which the earliest cases of 'spotted fever' have developed, while they remain for several weeks after 'spotted fever' cases. They move about freely and are readily carried by the wind. Were they the infected agents one mosquito would probably infect two or more persons in the same family, and the disease would not be limited by the river. Bedbugs and flies are present throughout the year, and, from their persistent activity, would probably infect more than one member of a family, were they the carriers of the disease.

"The extreme isolation of cases of 'spotted fever,' their occasional development in localities removed many miles from the site of any previous case, and a long period existing between the death or convalescence of the last case of any one year before the development of the first case in the following year, would point to the possibility of the red blood cells of some one of the lower warm blooded animals being the normal habitat of the parasitic protozoon in that stage of its life cycle not passed within the body of some arachnid. Of the animals within the infected region, the common gray gopher would probably best fulfill the conditions of such a parasitism.

"The writers are at present attempting to obtain data which shall confirm or demolish the above hypotheses."

Pending the result of further investigation into this very interesting subject, a few words relative to the limited danger to residents of the Bitter Root Valley, and the absolute certainty that the cause of the trouble once having been ascertained, its removal will speedily be accomplished, are justifiable.

Nothing derogatory to the district was intended by any of the parties to the investigation. On the contrary, the disease had become so prevalent and was so very fatal that the best interests of the valley demanded that the causes should be determined and removed if it were possible to do so. A meeting of the county commissioners, physicians and property owners had been held before the State Health Board made their first visit to the locality at which it was decided to send for eastern specialists to make an investigation. So greatly were the feelings of the people of the valley aroused that prices of real estate had declined and in some places no sales of property could be effected. The events of the summer allayed this feeling to a great extent and confidence has been once more restored, while the final conclusions of the scientists are eagerly looked for.

AMONG THE FARMERS AND LUMBERMEN.

Upon the general subject of sanitation it is not out of place to call attention of the farmers to the very important matter of the location of their farm buildings. Even a very limited knowledge of sanitation is sufficient to convince any person that in the grouping of farm buildings, and especially location of the well and outhouses, the gravest complications may be invited. The well and house should always be located above the natural drainage of stables and outhouses, but this is often neglected. Specific knowledge of the laws of sanitation is not necessary. A few grains of common sense applied while the location of farm buildings, well, and yards is being decided upon will be conducive to the health and perhaps save the lives of the farmer and his family, and without the expenditure of a single dollar.

Some years ago, Mr. William Hogan, acting as a special agent for this Bureau, made an investigation into the sanitary condition of the lumber camps, but aside from reforms instituted by the labor organizations, nothing was done toward betterment. With the erection of several extensive mills, and the abolition of the former system of letting logging contracts, much improvement is noticed. At some of the mills, houses have been provided for the men containing separate rooms, lathed and plastered and, altogether, very respectable and comfortable. There are still many cases, however, where the old style bunk-houses are in use, violating every rule of sanitation that was ever promulgated—vile, filthy and unhealthy to a degree that must be endured to be appreciated.

These buildings are simply rough-board shacks about 20 feet wide, 30 to 40 feet long, of one story and high enough to accommodate a double or triple row of bunks on both sides and across the back. As a protection from severe weather they are built tight and the only openings for ventilation are a window high up in the back end, generally 8 by 10 inches in size, almost invariably nailed in, and a low door in front. The men occupy the bunks, furnishing their own blankets. In this place, containing from 16,000 to 20,000 cubic feet of space, often as many as 65 or even more men are crowded. Clothing that has become soaked with snow, sweat or water during the day is hung around a huge box stove to dry to be ready for use the next day,

and in this foul atmosphere the men are compelled to remain month after month. The description of the cook house in the letter to Dr. Longeway fairly describes conditions that exist in numerous localities. It is no wonder that men sicken and die under these conditions, and that hospitals and undertakers reap a rich reward. The extracts from letters which follow were received in response to inquiries regarding conditions in the various camps and illustrate the necessity of sanitary regulations:

Flathead County.

"The work here is cutting ties. We eat and sleep out of doors. Wages are low and hours long. System of passing work is also bad. Many ties thrown out when pay-roll is being made up; afterward accepted, and the men thus lose their pay for their labor."

"There is no union here. Wages are not as good as in other places and the hours are longer. The men need an organization in this county very bad."

Missoula County.

"Conditions much better here since the union was formed. Bunk-houses are lathed and plastered, the ventilation is good, wages and hours are in the main very fair. Health of the camp is very good; should say above the average of lumber camps."

"Company should provide a place where the men could change and dry their clothing outside of the bunk-house where we are compelled to sleep, and these places should be kept cleaner. Wages and hours are looked after by the union and are generally satisfactory."

"Smallpox at this place was traced to a roll of blankets carried by a man who came from another camp to work here. The health officers established a quarantine which lasted several weeks. We pay enough to the company for board so that they can afford to furnish us with good clean beds, which would do a great deal toward stopping the spread of disease."

"I have had a long seige of typhoid fever caused by unsanitary conditions in the camp where I was working. Flies were very bad and no steps taken to prevent them from swarming in the cookhouse during cooking and meals. The doctor says that they caused my illness."

"Before the union was formed here our hours were eleven a day. Wages were \$30 a month. The union has raised our wages and shortened the hours to 10 a day. Food is very good but the flies are thick and the bunk-house is bad in snow or wet weather."

"This has been a splendid place to work ever since the union was started. Hours and wages are good. The company boards those men who prefer it or they can board where they please. The cook-house sets as good a table as many hotels and the sleeping quarters are better than many second-class hotels in the cities. There is no sickness to speak of."

"This camp is a small one and frequently moved, so our bunk-house and cook-house are not so good as some. Flies are very bad and there has been a good many men with typhoid fever. This is a union camp."

"Ventilation at bunk-house very bad. Too many men for air space

and no accommodations for men to dry their wet clothing. Many cases of typhoid fever."

"Have had many cases of smallpox. The system of compelling men to furnish their own blankets is bad. Company receives enough from the men for board to give first-class board and lodging."

"Men who desire to keep clean are handicapped by the system of bunk-houses. There is no place to dry clothes that are worn every day except at bunk-house stove. The air becomes vile and unhealthy and the large number of men sleeping in one room without proper ventilation brings on disease."

"Health conditions in this place very bad. Many cases of fever this fall (1901), and has been for a number of years. Bunk-house is not in good condition. Those who are anxious to keep it clean get tired of doing the necessary work all the time and consequently the place soon gets filthy. The company should employ the help to keep it in good order."

"Sleeping accommodations here are very poor. Bunk-house not cleaned for weeks at a time. Flies at cook-house also very bad. Wages and hours satisfactory."

"Typhoid fever in this camp very prevalent. At one time 26 cases out of 65 men employed. Health laws should be more strictly enforced."

"Chief cause of complaint in this locality is the lack of sanitary conditions. Many cases of typhoid fever every year. Have also had several cases of smallpox."

"We have about 50 men sleeping in one room 20x30 feet and 15 feet high. There is a door at one end and a small window at the other, but the latter is never opened. The heat comes from a large stove and when the men come in at night with their clothes wet they hang them about this stove to dry. The air becomes charged with unpleasant odors and makes the room very bad to sleep in. Complaints seem to bring no relief; the company seemingly does not care. Perhaps the one change that would be most beneficial would be to establish a separate room where the men could hang their wet clothes to dry as they have at the mines. There should also be more attention paid to the amount of air space in the sleeping room which should be largely increased. The practice of carrying blankets from place to place is not a good one, as many diseases can be spread in this way. Wages are better than before the union was formed, but the hours are too long.

Ravalli County.

"Bunk-house and cook-house in this camp are simply vile. Wages are so low and hours so long that men will not stay longer than to get a few dollars and then move on. There should be a union here and make these people do what other bosses in the lumber business are doing—use their men right."

"Many cases of 'spotted fever' from this camp. Cause of same not known but should be investigated. A large percentage of cases prove fatal. Wages and hours satisfactory."

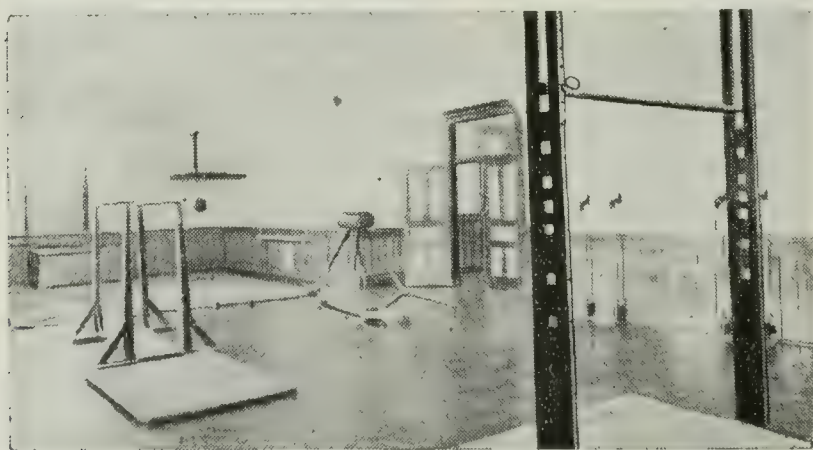
"No organization at this camp. Wages are low and hours longer than

where there are unions. Health of men fairly good but much typhoid and mountain fever at certain seasons of the year."

"Our wages are much lower here than in other places. We have to work eleven hours a day. Food is also bad—plenty of it, but not cooked in wholesome manner."

"Sleeping accommodations are very bad in this camp. No ventilation. About 60 men in one room with small door and one window 8x10 inches, but shut at night. With wet clothing drying at the fire the air becomes foul and very unhealthy."

A large number of workingmen have suffered from smallpox during the past few years and the various counties of the State has spent large sums of money in caring for patients and trying to stamp out this dread disease. In some localities quarantine has caused a total stoppage of work and the loss in wages from this cause has been considerable. Several physicians have expressed the opinion that the practice of carrying blankets from place to place by men seeking employment was responsible in some degree for the spread of smallpox. Considering the price charged for board in the camps—seldom less than a dollar a day—it would seem that the demand of the men for better accommodations was just and reasonable, and that there was no occasion for jeopardizing the health of the community by prolonging the barbarous, antiquated system of compelling men to furnish their own beds. It would be better for everybody if the system of "packing blankets" was at once and forever abolished, and the camps can never be brought to a sanitary condition until this is done. This much-to-be-desired change can be effected by agitation among the men, the assistance of the various boards of health and local physicians, and the co-operation of the employers.



GYMNASIUM ROOM, UNIVERSITY OF MONTANA.

THE SYSTEM OF HOSPITAL DUES.

Many of the foreign countries maintain, with state aid, an elaborate system of workingmen's insurance which includes payments for sickness, disability, accident, out of work and old age. Exhaustive reports upon this subject have been made by Hon. Carroll D. Wright, United States Commissioner of Labor, and Hon. Horace D. Wadlin, Massachusetts Commissioner of Statistics, and both accord the plan hearty commendation. In Montana the only hospital for exclusive use of railway employees is located at Missoula and is maintained by the Northern Pacific Railway Company from a fund which is accumulated by the collection of \$1 from each employee whose wages are \$100 per month and \$1.50 from each whose wages are more than that amount. For this the employees are given treatment in the hospital in case of sickness or injury while in the company's service. The hospital at Missoula is a model institution.

Among other classes of employees in the State, especially the miners, it is customary for the company to retain one dollar a month from each employee's check as hospital or doctor's fees. Decided complications arose over this, the men finding fault with the service rendered and with some of the regulations imposed. An agreement was reached in the majority of cases by which the men were allowed to select their own physician by ballot, and to receive treatment either in a hospital or in their own homes. The differences have all been adjusted and the only opposition the plan now meets is upon the ground that more money is collected by the companies than is paid out for medical services. There is little doubt that this complaint is well founded in many instances, and that the maintenance of this system is a source illegitimate profit.

Among the lumbermen and, indeed, with many others, there is a system of purchasing hospital tickets, generally at one dollar a month, upon some of the Catholic hospitals or those conducted privately by physicians. These tickets are in most cases sold direct to the men without any intervention by the employer, and a large sum of money is collected each month. There are many objections to this method also, the chief one being that it too often happens that at the time when it is most needed the ticket has run out, or the sufferer has failed to procure one for that month. In many cases the expense of caring for sick and disabled members who were unable to care for themselves has forced the labor unions to take this matter in charge by compelling their members to provide themselves with tickets through the union officials. All of these methods furnish a reasonable health insurance, for the minimum hospital charges are \$10 a week.

It is difficult to suggest a remedy for present conditions. The working population of Montana is migratory and not generally satisfied to remain for years in one place as employees do in foreign countries or in the eastern part

of the United States, and for this reason it would probably be impossible to successfully establish, as yet, any system of state insurance for workingmen, even if it were thought advisable to do so. There is no doubt, however, that the money paid out by the various counties each year for poor relief, if combined with that paid by individuals as hospital fees, would provide a nucleus for a state insurance fund, and lay the foundation of a system that would, in time, prove of great value. The workingmen need the protection of health insurance and the fact that the present system is expensive and unsatisfactory, will no doubt develop an agitation upon the subject which will lead to a more desirable method. In any event a change which would do away with any suspicion that more money was collected from the men than physicians' services actually cost, should be insisted upon, and some plan devised where patients would have absolute freedom of choice in the selection of their physician either in the hospital or at home. In the meantime a careful study of industrial insurance by both workers and employers is recommended.



HIGH SCHOOL, KALISPELL.

RAILROAD EMPLOYEES.

After the great sympathetic strike in 1894, the organizations of railroad men became very much demoralized throughout the country, and the Brotherhoods in Montana suffered with the rest. The time-honored custom of fixing wages and working rules by conference was abolished and arbitrary edicts upon those matters were issued by the companies, employment depending in all cases upon unquestioning acceptance of the new schedules. But even this harsh treatment, added to the horrible injustice of the blacklist, was not able to destroy the unionism of the railroad employees. Gradually, as the years went on, the old Brotherhoods were revived and new ones formed. The insurance features of the orders had, of course, suffered, but still they exerted a great influence in holding the organizations together. As the organizations gained in membership and influence the former system of conference upon wages and rules was re-established and during the years 1901 and 1902 the Montana Brotherhoods were represented in every meeting that took place between the managers of the various roads and committees of their employees, and much good was accomplished. Wage schedules were re-adjusted in many departments and so thoroughly that a large part of the employees received an advance. As usual, however, the poorest paid labor did not share in this prosperity. No change has been reported in the conditions of the section hands and laborers.

Gratifying as the success of the Brotherhoods is, there is another side to the situation. The vast increase of traffic upon the great trans-continental roads, the demand for more speed, and the rivalry for profitable government contracts, have combined to bring about enormous changes in railroading conditions and in every instance these changes have been detrimental to the employees. The complaints are numerous and legitimate. Under what is called the "personal record system" maintained by all the railroads in the country an employee who leaves the service of any company must secure from his superintendent what is called a "clearance" or "service record." If he fails to secure this or, as is often the case, if the "clearance" is made out in such manner as to convey the idea to other employers that the bearer has in any manner rendered himself in the least degree objectionable to the company, it is impossible for that man to secure employment on any railroad in the United States, Canada or Mexico. He may have spent the best years of his life in his chosen profession; may be sober, efficient, competent; a man of family; respected in the community and by his associates; suffering for the necessities of life; willing to do anything in the line of railroad work; in possession of testimonials of the highest character from other sources; but if he lacks a "clearance" from every division upon which he has even been employed, and particularly from the last one, there is absolutely no hope for him. Change of residence or even change of name will not avail. Sooner or later he is found out and discharge follows—immediate and peremptory. There is no appeal; there is no redress.

The unfortunate victim may simply have incurred the personal enmity of his superintendent or he may have been unjustly accused of some infraction of the rules. The result is the same as thousands of railroad men can testify. This system should be known as "A Complete and Ready Method of Manufacturing Tramps and Criminals." Ten years ago the Commissioner of this Bureau worked in the same crew with a young man in Missoula for the Northern Pacific Railway. This young man has been in the employ of the company continually since that time, in various positions, until the summer of 1902, and in all those years has never drawn a check from any other division, and he has never had any other employment than railroading. He was discharged without any reason being given and when he applied for a "clearance" received the following:

"The bearer has been employed in services on the Rocky Mountain Division of N. P. as Trucker, Car Checker, Switchman and Fireman from Jan. 1st, 1901 to March 17th, 1902."

(Signed.)

Now, the result of this letter is that no account of the long service of this man being given, and the inference of the "clearance" being that he passed through all the different branches enumerated in the short space of fourteen and a half months, that his services were unsatisfactory and he was discharged for that reason. He has applied for and been refused employment on different divisions of the Northern Pacific and on other roads. The result is that he is utterly unable to follow his chosen calling or to provide for his family through employment for which his experience and ability best qualify him.

Put yourself in his place. His character is exemplary. He has been a consistent member of the Good Templars practically all his life. His wife has been an invalid for several years. He has an interesting little family. His standing in the community is unquestionable and he is unable to earn a living at his customary business because he cannot furnish a satisfactory "clearance" owing to the vindictiveness of his former employer.

There are thousands of similar instances. Any railroad employee is liable at any moment to be placed in the same position. Competency, experience, sobriety, ability and character are absolutely swept aside in considering an application for employment. The personal record, as shown by the "clearance," has the right of way. The system is unjust, tyrannical, diabolical, criminal, and should be prohibited by law.

Again, the increase in the size of the trains which now contain more than three times the number of cars they formerly did, has brought no increase in the train crew who consequently have much more labor and responsibility. Firemen have been overcome through the hard toil necessary to keep up steam in the monster engines and have fallen insensible at their posts. The volume of traffic has become so enormous that very little attempt is made to maintain any regularity in hours of service and train crews are doubled over the road without sleep or rest until they become utterly exhausted.

A minister reported that he was riding in a caboose on a freight train whose crew had been in continuous service for 55 hours. Refusal to report when

called for duty is followed by discharge and the clouded "clearance" follows. Nor is this frightful condition confined to the motive power department.

Like conditions exist among the telegraph operators upon whose watchfulness depends the safety of all trains. Operators are supposed to adopt the famous motto: "We never sleep." Many a fatal disaster may be traced to this very cause. The root of the evil is parsimony on the part of the company. The safety of the lives and welfare of the public no less than of the employees, calls for legislative enactment limiting the hours of continuous service of railroad employees to such an extent, at least, as will guarantee them normal sleep and rest, and insure the greatest measure of safety. Until then every traveler's life is in added danger from the acts of men half dead from want of sleep and rest, but who are compelled to struggle on until a terrible accident results or exhausted nature succumbs.



LABORATORY ROOM, UNIVERSITY OF MONTANA.

FELLOW-SERVANT LAW.

The figures published by the Inter-State Commerce Commission, showing the number of railway employees killed and injured during the year ending June 30, 1902, are appalling. If any argument is needed to justify the enactment of a law by which this class of toilers may receive that protection of law they are rightly asking it will be found in the fact that out of a total of 1,071,169 employees no less than 8,173 were killed, and 49,211 were injured while in the discharge of their duty during that year.

Of trainmen, including engineers, firemen, conductors and brakemen, one in every 136 was killed and one in every 13 was injured, and this frightful slaughter continues with but little variation year after year. The general government, in an endeavor to prevent it, passed a law requiring certain safety appliances to be attached to all trains, but the time for compliance by the railroad companies has been extended from time to time, so that the full benefits of the law have not, as yet, been realized.

But it is to another phase of this question that this is particularly addressed, and that is, the peculiar court construction upon common law under which the vast majority of the victims of railway accidents are deprived of the right of redress in an action for damages against their employer from the fact that they are held to be "fellow servants" of the parties whose act caused the accident.

During the session of the Seventh Legislature, no less than three bills were introduced, looking to the enactment of a fellow servant law for the State of Montana. Two of these bills originated in the House and one in the Senate. They all failed, however, to become law, and the question is still to be settled. That it is of great importance, no one will deny. And that persistent agitation of it will, in time, bring a solution of some sort is also probable. It is important that legislation upon this subject should be not only consistent, but in line with the most advanced thought in the same direction with that of other states, and to that end the following from a special message of Governor Stone to the Legislature of Missouri is herewith presented, as one of the most intelligent and comprehensive expositions of the question of the fellow servant law that is in existence. Governor Stone says:

"I ask the General Assembly to enact a law defining the relations between railroad corporations and their employees, and also to define and fix the legal liability between such corporations and their employees for injuries suffered by one employee, as the result of the culpable negligence of another employee, while engaged in the service of the same corporation.

"Nearly 60 years ago, two servants of an English butcher were riding on a wagon, used by their master in his business, and by reason of some defect in the wagon, or some negligent act of one of the servants, or partly from both causes, the other servant was injured. Suit for damages was

instituted by the injured man against his master, and in that case it was held by Lord Abinger, in the court of Exchequer, that the master was not liable to one servant for injuries received as the result of the negligence of another servant engaged in the same common service, unless the master was himself guilty of negligence in employing or retaining the servant whose negligence caused the injury.

"From this sprang the doctrine of the master's exemption from liability for injuries received by one of his servants by reason of the negligence of his fellow servant. Upon this precedent other cases were decided, until the rule laid down by Lord Abinger has come to be generally accepted as the doctrine of the common law. This rule of the common law, as administered by the courts, is sweeping in its application. Very few exceptions to the rule have been admitted. It has been broadened in its application until it covers all classes of servants, without regard to the nature of their employment.

"Whether this rule, as applied to the servants of a master engaged in the simple and purely private business of a butcher, is just, it is needless now to argue. But the difference in condition, and in the character, purpose and scope of the employment of servants of an English butcher and those of a great semi-public railway corporation, is so marked and clear as in my mind to separate them and place them on a different footing. How can any just comparison be made between two servants of a butcher, familiar with each other by daily association, acquainted with the simple methods and harmless means employed in the conduct of a business almost wholly free from danger, and in the prosecution of which they are ordinarily in contact and in the presence of each other; and the servants of a great railroad corporation, numbering thousands, scattered for hundreds of miles, employed in widely different classes of labor, having no direct connection, and in the main unacquainted with each other, and all, or nearly all, engaged in a work of peculiar hazard? Can any just comparison be made in the condition, responsibility, or the nature of the employment between two butcher boys, driving a wagon, loaded with tallow, along a public street, and a railway engineer and conductor in control of a train of cars, loaded with human beings, and flying with the speed of the wind along a railroad track?

"The difference is so complete and emphatic as to make the comparison absurd. And ought there to be no difference in the nature and measure of the responsibility of such masters as these to their respective servants? Let me suppose a case: A passenger train starts out of St. Louis at night, encountering a storm so black that the fiery eye of the locomotive seems only to make the darkness visible, and dashes away over hills, along winding valleys, around obscure curves, at a speed of 40 miles an hour, with the engineer at his post, his hand upon the throttle and his eyes watching for any signal of danger, when suddenly there is a jar, a lurch, a crash, and the engineer is buried in the ruin. An incompetent, negligent or vicious switchman, has failed to do his duty. By reason of the carelessness, negligence or indifference of this switchman, employed to perform certain duties the en-

gineer is crushed or burned to death, or terribly mutilated. With the employment of the switchman, the engineer had nothing to do; he had no connection with him; he did not even know him. The engineer was in no sense to blame; he had simply discharged his duty to the fullest limit. Under the law of Missouri the engineer would have no legal claim for damages against his employer. Is that right?

"Let me suppose the case of a train that should have been side tracked, but on the contrary was ordered to proceed, and in consequence of which a collision occurred with terrible effect on trainmen and passengers. The disaster was due to an operator who misunderstood or was incapable of understanding his orders, or was guilty of some gross negligence. The train men were not to blame; they simply obeyed orders and discharged their duty. Should they be denied all right of redress against their employer who takes a man into his service so incompetent or negligent as to precipitate such disasters?

"It will not do to say that the employer was unaware of the habits or inefficiency of the switchman or operator. It should be his duty to keep himself informed. Passengers injured in such wrecks would have a cause of action. Why should it not be equally the duty of the master to protect its employees in such cases as I have stated?

"Disasters of the kind described have occurred. It would not be difficult to multiply instances similar in nature, if not in detail. Such cases illustrate the unreasonable injustice of the harsh rule of the common law, and demonstrate the necessity of some material modification of it. The force of this necessity has been recognized both in England and America.

"In England, where the doctrine of exempting the master was first announced, it has been greatly mitigated by statutory enactment, and in its application to servants operating railway trains almost wholly abrogated. A number of the states have entirely changed the rule of the common law, insofar as it applies to the employees of railroad corporations.

"Section 2002 of Iowa codes provides that: Every corporation operating a railway, shall be liable for all damages sustained by any person, including employees of such corporation, in consequence of the neglect of agents, or by any mismanagement of the engineers or other employees of the corporation, and in consequence of the willful wrongs, whether of commission or of omission, of such agents, engineers or other employees, when such wrongs are in any manner connected with the use and operation of any railway on or about which they shall be employed. And no contract which restricts such liability shall be legal or binding.

"Laws of similar import, and more or less comprehensive, in the different states, have been enacted in Georgia, Wisconsin, Kansas, Florida, Massachusetts, Minnesota, Montana, Wyoming and others. In Mississippi the new and better doctrine was incorporated in the constitution adopted in 1890. The 193rd section of that instrument provides that: Every employee of any railroad corporation shall have the same right and remedies for any injuries suffered by him from the act or omission of said corporation or its employees, as are allowed by law to other persons not employees.

"When the necessity of a more humane and enlightened rule—one more in harmony with the altered conditions of our later civilization—is being so generally recognized, both in our own country and abroad, why should Missouri stand obstinate in the path of progress, and cling stubbornly to an ancient precedent which is fast coming under the ban of universal disapproval? Why should not Missouri enact a law for the protection of the 25,000 men employed in operating the railroads of this state? Why should Missouri postpone to the very last, much less deny, any modification of a rule, unjust in itself, which never had legislative sanction, but exists purely as the creation of judicial precedent and which stands almost universally condemned by public opinion?

"I venture to assert that there are not ten men in a thousand who would conscientiously deny that a right of action should exist in such cases as I have above described. Why, then, do we persist in perpetuating a rule of law which shuts the door of the court room in the face of men who have suffered injuries for which, in all good conscience and fairness, as a matter of wise public policy and simple justice, they should have redress? I will not say, for I do not believe, that there is no man honestly opposed on principle to a measure of the kind in question. It would be difficult to propose any important measure of legislation or public policy which would be free from criticism or opposition from all quarters; but there are some men, often some good men, so constituted that their natural sphere is opposition.

"But this I say, without fear of serious contradiction, that a statute of the character proposed could be easily enacted if the tremendous influences of the railroad corporations were not concentrated in constant and active opposition. Is there one to doubt that such a law would find a place on the statute books if that opposition did not exist?

"And why do the corporations oppose it? Only because it would result in increasing to some extent their own pecuniary liabilities. I know of no other reason for their opposition. But exemptions from pecuniary liability in this behalf is, in itself, a denial of a right to others which should not be denied. Consideration of that character cannot justify the maintenance of a rule of law, which, if not wrong in its inception, has been so widened in the scope of its application that manifest injustice is now frequently done under its operation.

"I would not do the least injustice to railroad corporations. But they should do justice to themselves; they should not seek an advantage, nor strive to avoid just responsibilities. Especially should they not resort to vicious or improper means to perpetuate an advantage that ought not to exist at all."

What Governor Stone has said of the common law, the opposition of the railroads, and the crying need of statutory enactment in behalf of a fellow servant law in Missouri, applies identically to Montana.

The foregoing analysis of this question is clear and convincing. Whatever may have been the reason for the rule in former times, that rule can scarcely hold now under our modern complicated civilization. Seventy years ago the employees of a stage coach company might have known each

other personally; if one suffered because of the incompetency of another, the master may have been justified in claiming exemption from liability on the ground that the injured man knew his fellow servant and was negligent in not reporting his incompetency. But what do the employees of a modern railway know of each other? There are sometimes 30,000 men working for the same company. What can these fellow servants know of each other? Some may be in Missouri, others 2,000 miles away in California or Texas; is it not an absurd fiction that supposes, because they are fellow servants of the same corporation, that hence they know one another, and are responsible for each others incompetency? It has been held in Missouri that a fireman is a "fellow servant" of a section hand. The fireman may live at the other end of the road, hundreds of miles away; the section hand may never have seen the fireman unless, perhaps, as he dashed by on his engine at the rate of 30 to 50 miles an hour; yet, in the absence of statutory enactment, the fellow-servant rule applies, thus implying that the section hand was negligent in not knowing and reporting the fireman's incompetence or careless habits. A man is employed to stand at a cable car curve and give signals so that only one train at a time can pass; what reason is there for presuming that this man has opportunity to know the efficiency and carefulness of the gripmen on the cable cars? As a matter of fact it is probable that all he knows of the gripmen is what he can learn from the flash light view he gets of them as they dash around the curve. Yet, by a fiction of law, he is presumed to know them—presumed to be himself at fault, if he fails to report the inefficiency or careless habits of any particular gripman, and is deprived of all right of action when injured by the gross negligence of that gripman. In one instance the general manager of an iron mill ordered an employee to do some work in and about the machinery; then, through negligence, the manager set the fly wheel in motion, whereby the employee was severely injured. The courts held that when the general manager went into the works and started the fly wheel, he thereby became transformed from a manager into a common workman and was at the time the injury occurred, not acting as a general manager but as a "fellow servant" of the workman who was hurt, and hence the company was not liable for the damage. (*Crispin v. Babbitt*, 1880-81 N. Y. 516.)

Examples of this nature could be extended, but enough have been given to show the construction that has been put upon the original ruling in the absence of any statutory law.

Governor Stone mentions the fact that Montana had passed a law bearing upon the liability of corporations in these cases. It is true that the Codes do contain the following section:

Section 905, Civil Code: "In every case the liability of a (railroad) corporation to a servant or employee acting under the orders of his superior, shall be the same in cases of injury sustained by fault or wrongful act of his superior, or to an employee not employed or controlled by him, as if such servant or employee were a passenger."

The history and present status of this section is here given. This law was originally passed by the Territorial Legislature in 1873, and was ap-

proved May 7th, of that year. In 1895, after the admission of Montana as a State of the Union, the same law was included in an edition of the codes and statutes adopted by the act of the Legislature approved February 19, 1895, as the law of the State. In a decision of the Supreme Court rendered in November, 1895, it declared that the above statute established the principle that there is a difference in the grade of the employees in a common employment, and that it gave the right of action to a servant, injured through the negligence of a superior employee, against a master, when such injured servant was without fault or negligence on his part. Subsequently a rehearing of this case was had, and as a result thereof the Court decided that this Territorial statute had been annulled by the provisions of the State Constitution, for the reasons that it applied to domestic corporations only; that, therefore, it placed a greater burden upon domestic corporations than upon foreign ones operating in the State, and that being so, it was necessarily in conflict with Section II of Article 15 of the Constitution of the State, which prohibited the giving to any foreign corporation, or the exercise by the same, of any greater rights or privileges than those possessed by domestic corporations. In the sense as used above, the words "domestic" and "foreign" apply, the one to corporations created by the State of Montana, the other to corporations created outside of said State, whether within the limits of the United States or not.

From the above it is clear that said section, while a law of the Territory of Montana, never really became a law of the State, and Montana is, in effect, at the present time, without legislation changing the common law rule.

During the last session of the Legislature there seemed to be a great amount of misapprehension among the members, as well as those working men who interested themselves in the different bills upon this question that were introduced. Among many of the workingmen the idea prevailed, that "the fellow servant law should be repealed." Others thought that what was necessary was a voluminous law that would define "principals, vice-principals" and many other relations. This idea was also carried out in the different bills that were before the Legislature. But the foregoing history not only shows that employees are not suffering through any law, but simply from the court construction of common law, or a precedent. A law of a few lines will afford the relief sought.

It cannot be too strongly brought out that the fatal defect in the rule now in vogue is, that under it, a man loses certain rights through the action of a fellow whose employment by the corporation he can in no way control. If the engineers employed the train crew or trackmen, hiring and discharging whom they knew to be competent or otherwise, the case would be entirely different. Men are compelled to work every day with others that they know to be careless or incompetent. They have no voice in the matter. To complain is to lose their positions. Train crews are compelled to take their trains over the road, worn out from lack of sleep, on orders from operators who can barely keep awake. They know the great danger they are in, but are powerless. Again there is the absolute impossibility of personal

knowledge of qualifications extending to all the employees of a great system, and for this reason alone, if for no other, the liability of those responsible for the employment of the working forces, should extend to their acts, whether of commission or omission. This can be accomplished by the re-enactment of the act of 1873, so amended as to meet constitutional requirements.

We have the perfected laws of other states as a guide, and as the decision of the Supreme Court of Montana leaves us with nothing but a judicial precedent, based upon a perversion of an English Lord's ruling on a common law point, for the protection of thousands of corporation employees in this State, prompt action by the Legislature is most desirable. The law should be plain, simple and direct; burdened with no definitions, but clearly fixing the liability to servants exactly the same as liability to passengers, and contracts abrogating such liability should be declared null and void. This is no new departure. Laws of this kind are upon the statute books of various states, as well as others defining the duties and responsibilities of employers. Section 2660-62 of our own Civil Code read as follows:

"Sec. 2660. An employer must indemnify his employee, except as provided in the next section, for all that he necessarily expends or loses in direct consequence of the discharge of his duties as such, or of his obedience to the directions of the employer, even though unlawful, unless the employee, at the time of obeying such directions, believed them to be unlawful.

Sec. 2661. An employer is not bound to indemnify his employee for losses suffered by the latter in consequence of the ordinary risks of the business in which he is employed.

Sec. 2662. An employer must in all cases indemnify his employee for losses caused by the former's want of ordinary care.

If consideration is given the enormous number of violent deaths that occur in this State every year, most of which are directly attributable to faulty appliances, lack of proper safe guards, neglect, carelessness and incompetency, and the further fact that sufferers from these conditions are totally unprotected by statutory law, the necessity for immediate action is at once apparent. If there is opposition on the part of the railroad corporations, it only emphasizes the duty of the State to protect this large class of helpless citizens.

The corporations will not surrender their right to employ whom they please, and invariably give the applicant's "personal record" preference over his experience and competency. It therefore follows that in the exercise of this right, the liability for the acts of such employees is also assumed directly by the employer and not by the fellow employee, and the statute should so establish it.

This law is not contended for with the idea that a greater amount of money will be awarded by the courts as damages or that its passage would result in more suits, with better prospects of obtaining a verdict against the corporation. The idea is rather, that knowing that the common law rule relating to fellow servants had been superseded by an employers liability law, the corporations will exercise more care in the selection of experienced, careful and reliable men, adopt better and safer, appliances

institute a more thorough inspection, and so far as human care and foresight can do so, eliminate, or at least curtail, the horrible and promiscuous maiming and slaughtering among their employees, which is now so prevalent. This frightful loss of life and limb can be in a great measure avoided. But so long as the corporations can escape with impunity the results of criminal carelessness, or negligence—so long as human life continues to be the cheapest commodity on earth—so long will the necessity for such legislation as is called for in this instance, exist.

The railroads have been the beneficiaries at the hands of the people of enormous grants and privileges. In management and in the tolls charged they are almost wholly unrestrained in Montana, at least, they being independent of any supervision by the State. It is not unreasonable, therefore, to expect that they will accept the responsibilities which rightfully belong upon them, and in return for the privileges which they enjoy accept a law which will provide the greatest measure of safety and protection to the public, as well as those unfortunate ones whose necessities force them into hazardous occupations, and who lose their lives in the discharge of duty.



SOME RESIDENCES IN LEWISTOWN.

WAGE SCALE.

In general, wages in Montana are fixed by the unions and the accepted going rate of wages is the union scale. Many years ago the Butte Miners' Union fixed the wages for underground miners at \$3.50 a day, and this scale has never been changed. It gradually spread over the entire State, and with very few exceptions, is recognized in every quartz mine in the State. In the coal mines the contract system prevails and the wages generally run a little lower than in quartz mines, \$3.00 to \$3.25 a day being about the average. In the logging camps and saw mills the wages are \$40 for the lowest; teamsters with one team \$45, and with four horses \$50 a month, with board. In the saw mills wages run from \$2 a day up, the setters getting as high as \$7 a day, most of the employees getting about \$2.50 a day. Farm hands receive from \$20 to \$45 a month and sheep herders about \$35. Range riders and ditch riders get about \$40 a month. Among railroad employees there is a vast range in the scale of wages and the earnings gained by overtime make the monthly checks seem large. Engineers receive 4 and 4½ cents a mile 100 miles constituting a day's work; more than that number of miles is considered overtime. Firemen receive 2 and 2½ cents a mile under the same conditions. Brakemen and switchmen receive from \$35 to \$90 a month with allowance for overtime. Railroad machinists and shopmen get from 17 cents an hour to \$3.60 a day. Operators get from \$45 a month up. Section hands, Chinese, Japanese and Greeks draw from \$1.15 to \$1.50 a day. Wages in the smelters average about \$3 a day though there are some positions that pay more. Stationary engineers get from \$50 a month in heating plant to \$4 a day. Teamsters with team receive from \$4 to \$6 a day, and common labor from \$2 to \$3.00 a day. Clerks where organized generally receive \$60 a month, low for males, and \$40 for females, but there are cases where girls only get \$10 a month and have to board themselves. Street car employees wages are from 20 to 30 cents an hour. In steam laundries wages for female help are from \$5 to \$15 a week. Males get from \$15 to \$25 per week. Barbers generally work on a guarantee of \$16.00 to \$18.00 a week with a percentage after they have done a certain amount of work. Male cooks wages range from \$16 a week up. For women from \$25 to \$60 a month. Waiters get from \$20 a month for women to \$10 and \$15 a week for men. In this business it very often happens that skillful workers draw much more than the union scale. In the building trades the building laborers generally receive 50 cents or \$1.00 a day more than common labor. Carpenters get from \$3.50 to \$4.50 a day. Bricklayers, stone-masons and plasterers range from \$5 to \$7 a day. Plumbers, \$6; Painters from 35 cents to 50 cents an hour. None of these trades work more than nine hours and a great many have the eight hour day. Quarrymen receive from \$2.50 to \$3.50 a day. Linemen, an average of about \$3 a day. Bakers wages are about \$3 a day, including Sundays, and brewers get \$4 a day for

eight hours. In the bottling works the wages are \$3.25 for eight hours. In the flour mills the lowest wages are \$2.00 a day. Machine typesetters get \$4.50 to \$5.00 for 8 hours. Tailors, from \$18 to \$21 a week. The scale of wages for cigarmakers runs from \$10 to 23 per thousand according to the size and quality of the cigar. Office employees and stenographers range from \$50 to \$150 a month. Butchers get from \$3 to \$4 a day. Dressmakers earn from \$6 to \$15 a week, and the employees of the garment factory make about the same. There are few men employed at less than \$2.00 a day or its equivalent, in the State, and the average general wages are about \$2.50. Bartenders wages vary in the first, second and third-class places. Where organized, \$90 a month without board is the minimum. Iron molders have \$4.50 a day. In brick yards the wages are from \$2.50 a day up, skilled labor being well paid. Harnessmakers \$3 a day. Candymakers \$3 a day.

There are still a few places where the conditions seem to require long hours, as with cooks, who work twelve hours or longer, and in the flour mills some of which run day and night with 11-hour day and 13-hour night shift, but the majority of employees work less than 10 hours if those employed upon the railroads and farms are excepted.

It is to be hoped that no one will be deceived into coming to Montana for the purpose of taking advantage of the high wages. While it is no doubt true that there is employment to be had in certain localities and at rush seasons, there are many experienced men who are in enforced idleness. Montana is a state of magnificent distances and railroad fare is expensive. Cost of living does not matter so much if you are working, but it is just as high if you are idle. Montana has her share of poor people and suffering. It is harder to get employment where you are a stranger than in a community where you are well known. Board is much higher than in the East; so are rent and living expenses. The principal employments are in the mines, lumbering, stock ranches and on the farms. There are no factory towns, consequently no opportunity for employment such as you have been accustomed to at home. The cities are lively and modern, but the smallest towns are primitive and much of the country very wild and rough. Altogether the prospects for a workingman are not inviting unless he has sufficient capital to establish a small business and work for himself. For such as these the field is broad and the outlook promising and there is a great demand for women for general housework at good wages, \$20 to \$30 a month.

LABOR ORGANIZATIONS.

For hundreds of years workingmen have maintained organizations in various forms for their mutual protection. It is impossible to conceive the conditions that would exist at the present time had the workingmen of the past neglected their opportunities in this direction or if all labor unions were abolished to-day. The influence of an advance in wages through a union is felt in all avenues of life. The standard of living is immeasurably better in communities where wages are high, not alone for the members of the union, but for all the people. Trades unions are a great factor in industrial evolution. They are not to be dismissed with a sneer or contemptuously overlooked. The scope of the organizations is wide and their origin was in response to necessity. They make labor respected by making men respect themselves. They educate men and women in the exercise of a choice of avocation. They save the home by protecting the mother and child against the demands of merciless commercial competition which often drives employers into unholy traffic in human life. They prepare the way for further advance of social evolution in whatever direction the wishes of men may desire or direct. They increase the market for manufactured products by increasing the wages, thus indirectly benefiting all engaged in production and distribution. They bury the dead and teach the beauties and fraternities of mutual relief and assistance to the living. They offer employers a medium for the orderly settlement of all disputes as to wages and conditions of service and make arbitration and conciliation possible by substituting discipline for mob rule. They confer a benefit by the mere fact of bringing men together, softening their prejudices, getting them better acquainted with each other and teaching them to sacrifice, if need be, immediate individual good for the welfare of the majority. They deliver an emphatic protest against the present system whose defenders declare a social and industrial right to coin the lives of men, women and children into dividends. They declare that the present system of production and distribution is a failure because it makes possible the horrible contrasts in conditions that now exist. They demand that the wisdom of the people shall devise and adopt a more rational, equable and righteous system in which each individual shall be guaranteed the right to life, the right to the means of living, and the right to the fruits of his toil. They declare that as labor produces all wealth it is entitled to that which it has created.

Montana is justly proud of her labor organizations. Great in so many other directions, she maintains her supremacy in this. Some of the greatest labor organizations in the world have their home in this commonwealth.

For obvious reasons the number of members in the local unions is not given out for publication, and all estimates are merely guess work. The only general organization that maintains headquarters in Montana is the American Labor Union, organized in the City of Salt Lake in 1898. Mr.

Daniel McDonald of Butte, is president and has held that position since the formation of the union, and it is to him more than to any other individual that the immense success of the order is attributable. Mr. Clarence Smith, also of Butte, is the secretary and is the editor and manager of the American Labor Union Journal, the official organ. Mr. Smith is one of the best general secretaries in the country and enjoys the esteem of his fellows to a high degree. The American Labor Union admits both men and women to membership, regardless of race or color and is highly progressive. It is served by an executive board of which the president and secretary are members together with H. L. Hughes, Spokane, Wash.; F. W. Ott, Laramie, Wy.; F. W. Walton, Wallace, Idaho; M. E. White, Leadville, Colo.; F. J. Pelletier, Butte, Mont.; C. P. Lafray, Bonner, Mont. Mr. D. F. O'Shea of Cripple Creek, is vice-president.

Yearly conventions are held, generally in the city of Denver, at the same time as the convention of the Western Federation of Miners, the two bodies being affiliated. The general organization is supported by a per capita tax of 10 cents a month upon each member in good standing. The Journal is supported by an assessment of 50 cents which was levied October 1, 1902, and by the payment of 50 cents for each member initiated into a local union. A general label is issued, which is used on many of the products made by the members. The order is in a flourishing financial condition and is rapidly growing in membership and influence.

The last convention declared for independent political action for workmen and the platform of the Socialist Labor Party was adopted as its declaration of principles.

Working in the closest harmony with the American Labor Union is the Montana State Trades and Labor Council, which is composed of delegates from affiliated unions in the State without reference to their other associations or the occupations of members. This organization was formed in the city of Helena during the first week in May, 1895, and is very properly recognized as a great factor in the protection of workmen. Headquarters are maintained in Butte. Mr. William Erler and Mr. O. M. Partelow are president and secretary, respectively. Both are very active and earnest in the labor movement and under their direction the organization will make rapid progress. The central body is sustained by a per capita tax of 15 cents a year, payable quarterly, on all members in good standing in the local unions affiliated, and has spent a large amount of money in the circulation of economic literature. Yearly conventions are held, the place of meeting being selected by ballot in each convention. The State Council has also been a great factor in advancing labor legislation and originated the present political Labor Party.

There are a number of county organizations which exert a great influence in labor affairs, but which from their nature are confined in their operations to a much narrower territory. The most prominent of these is undoubtedly the Silver Bow Trades and Labor Council of Butte, which is composed of delegates from all local unions in that county except the building trades, which support a council of their own. Both these bodies

have competent officials and exert a wonderful influence. The Western Montana Trades and Labor Council has jurisdiction over Missoula and Ravalli county unions with headquarters in Missoula. Deer Lodge, Cascade, Lewis and Clarke, Flathead, Yellowstone, and Carbon counties all have central bodies which are similar in formation and purpose and work in harmony upon all matters of common interest.

Among so many powerful and progressive local unions it is difficult to make special mention without expressing favoritism, although none is intended. Butte Miners' Union in membership, wealth and influence, however, is so easily in the lead that no one will refuse to accord the first place to this body. Having approximately 4,000 members in good standing, spending thousands of dollars a year in sick and death benefits, maintaining a uniform standard of wages and conducting its affairs for many years without a strike or disturbance of any kind, officered by brainy, fearless and progressive men, and admired and imitated by all, it is indeed a model organization. It is affiliated with and was one of the organizers of the Western Federation of Miners; has a large treasury and owns its own hall, a valuable and remunerative property on upper Main street in Butte.

Butte Mill and Smeltermen's Union also affiliated with the Western Federation of Miners, as are all like organizations in the State, is also well deserving of special mention together with the Butte Workingmen's Union, Butte Stationary Engineers and Butte Carpenters, the latter owning their own hall. Many unions outside of Butte although not so numerically strong are equally as effective and are doing their share in securing benefits for their members. The work of organizing new unions is principally in charge of President McDonald and Mr. R. C. Scott for the American Labor Union, and Mr. Phil. Bowden, member of the Executive Board and organizer for the Western Federation of Miners. There is also a large number of local organizers.

The United Mine Workers of America also has an organizer, Mr. Alex. Fairgreives, and several of the unions of coal miners in the State have charters from that body.

The gentlemen named have organized a large number of new unions during the past two years among which are the Fruit Growers Union and the Farmers Protective Union, two new departures in this State in the way of organization. A special effort is to be made to establish unions among the farmers, and it is expected that they will use the union label upon their produce to distinguish it from that grown by Chinese. In a number of places the unions own their own hall property. Missoula unions own a large plat in the cemetery and the Helena unions own and operate a steam laundry on co-operative lines. There is a healthy sentiment in favor of co-operative enterprises and also for workingmen's clubs, a number of which are now being successfully conducted.

CHINESE AND JAPANESE.

The expiration of the Chinese Exclusion Act on May 5, 1902, led to a great activity on the part of those opposed to immigration of Asiatics to the end that the provisions of the act might be greatly enlarged. Their efforts in this direction were not successful as, although the life of the act was extended, Congress failed to pass an exclusion act that will exclude, but contented itself with adopting the following substitute, offered by Senator Platt, for all pending measures.

"That all laws now in force prohibiting and regulating the coming of Chinese persons and persons of Chinese descent into the United States and the residence of such persons therein be and the same are hereby extended and continued, including the act entitled 'An Act to Prevent the Coming of Chinese Laborers to the United States,' approved September 13, 1898, so far as the same is not inconsistent with treaty obligations now existing, in full force and effect until the seventh day of December, 1904, and so long as the treaty between China and the United States concluded on March 17, 1894, and proclaimed by the President on the eighth of December, 1894, shall continue in force, and said laws shall apply to all territory under the jurisdiction of the United States and to all immigration of Chinese laborers from the islands to the mainland territory of the United States, or from one portion of the island territory of the United States to another portion of said island territory; provided, however, that this shall not apply to the transit of Chinese laborers from one island to another of the same group or to any islands within the jurisdiction of any state or the district of Alaska.

"That in case the said treaty be terminated as provided in article 6 thereof, this act and the acts hereby extended and continued shall remain in force until there shall be concluded between the United States and China a new treaty respecting the coming of Chinese persons into the United States and until appropriate laws shall be passed to carry into effect the provisions thereof.

"That the Secretary of the Treasury is hereby authorized and empowered to make and prescribe, and from time to time change such rules and regulations as he may deem necessary and appropriate to execute the provisions of this act and of the acts hereby extended and continued and of said treaty of December 8, 1894, and with the approval of the President to appoint such agents as he may deem necessary for the efficient execution of said treaty and said acts."

The census report shows that there was not a Jap in Montana in 1880. Ten years later there were six and on the 30th of June, 1900, the number had increased to 2,441, distributed among the counties as follows:

Beaverhead	89
Broadwater .....	...
Carbon	26
Cascade	24
Choteau	628
Custer .....	...
Dawson .....	...
Deer Lodge	124
Fergus .....	...

Flathead	303
Gallatin	1
Granite .....	...
Jefferson .....	...
Lewis and Clarke	45
Madison .....	...
Meagher .....	...
Missoula	398
Park	321
Ravalli	31
Silver Bow	63
Sweet Grass .....	...
Teton	66
Valley	307
Yellowstone	11
Crow Reservation	4

The Chinese population of the State is given by the same authority as 1,739, of which 39 are women.

Notwithstanding the fact that a statement was given out some time ago that certain railroads had become dissatisfied with this class of labor, it is certain that the number of both Chinese and Japanese in this State has increased since the above figures were collected. They are invading other classes of employment than railroad work, and so far as the Bureau is able to learn, the Japanese, especially, are not particular upon the question of wages, their main object being to get an opportunity to learn the language and methods of the Americans. The chief objection, however, to this class of people lays in the fact that no country should admit, as immigrants, any persons upon whom it is unwilling to confer all the rights and privileges of citizenship. If this position is correct, there can be no doubt as to the attitude of the majority of the people of the United States upon the question of conferring citizenship upon Chinese and Japanese residents, and opposition to their coming might well be based upon this ground rather than upon their interference with the labor of our own people, serious as this phase of the question is. Decided action has been taken in several localities in Montana during the present year looking toward the exclusion of the Chinese, the general method adopted being to refuse to patronize them. The results of the great agitation of this question a few years ago in Butte, which culminated in a suit that was carried to the Supreme Court of the United States, and which has now assumed the form of a suit for damages against the General Government, acts as a strong deterrent against similar action in many places.

It is doubtful whether it is possible to arouse sufficient public sentiment against these foreigners, in communities where they have already become a fixture, to eliminate them entirely, but it is clear that it is only by this means that any check whatever can be put upon their encroachment. People should understand that the money spent in patronizing them is almost totally lost. The object of every Chinaman is to accumulate enough money to enable him to return to his own country. It should be understood that he not only

takes this money away with him, but that even the necessities of life that he requires during his residence here are brought, in the main, from China, and that the employment of any number of Chinese here is of no benefit to the local merchants for that reason; that all Chinese and Japs alike work under a system of padrones; and, finally, that they are filthy and subject to many loathsome diseases and vices.

In substantiation of this last statement a summary of the report of the grand jury sitting recently in San Francisco is appended without comment:

"It is just seventy years since the struggle for the abolition of negro slavery was begun in America. On January 1, 1831, William Lloyd Garrison published the first number of his *Liberator*. In his introductory article he devoted it to the cause of human freedom in these words:

"On this subject I do not wish to think, or write, or speak with moderation. No! no! Tell a man whose house is on fire to give a moderate alarm; tell him to moderately rescue his wife from the hands of the ravisher; tell the mother to gradually extricate her babe from the fire into which it has fallen; but urge me not to use moderation in a cause like the present. I am in earnest—I WILL BE HEARD. The apathy of the people is enough to make every statue leap from its pedestal, and to hasten the resurrection of the dead.

"The horrors of the Chinese slave trade in San Francisco are infinitely worse than those described by Harriet Beecher Stowe in the thrilling pages of 'Uncle Tom's Cabin.' This we say regretfully, but with emphasis, and we have faith and are determined that, like William Lloyd Garrison, we will be heard.

"The testimony we have taken in this regard is appalling. It would almost pass belief if it were not that we saw many of the victims of the infamous traffic in the bodies and souls, the flesh and blood, the lives and virtue of human beings, and heard their sad and awful story of wrong and suffering and degradation corroborated by responsible Christian men and women—stories which should 'stir the very stones to mutiny,' but which have apparently failed to move the hearts of the men at the head of the San Francisco police department.

"As the chief of police has averred that he is governed largely by public sentiment, it is to be hoped that it will add its thunder tones to the already stern and explicit mandates of the law. The people have already spoken in the statutes which the chief has sworn to enforce. It is a pity that in such a cause they should have to speak again, for delay means degradation worse than death to helpless child slaves, but we find it our duty as sworn servants of the law to report that he is neglecting to enforce the statutes.

"Hundreds of millions of dollars were expended, and hundreds of thousands of lives were sacrificed, ungrudgingly, for the abolition of black slavery, which, comparatively, was a mild form of servitude. Sometimes the black women were compelled to serve the lusts of their owners, but it is not of record that they were compelled to earn money for them by enforced prostitution, and cruelly beaten and tortured if they did not earn enough to satisfy

the greed of their owners, as is of record in the investigation of this grand jury of the Chinese slave trade in San Francisco.

"The crime is equally heinous, no matter against whom committed. To know that even one human being—particularly if that one is friendless, helpless, and despised—is compelled to lead this life of unspeakable horror—to know this and yet to fail to uplift a hand in help, is damnable.

"The value of an attractive female in slavery days was from \$1,800 to \$3,000, just the value of an attractive Chinese female slave in California to-day. But the value of the former 'property' was based upon the protection of the state and federal laws, while the value of the latter 'property' depends almost wholly upon the police protection which it receives in violation of the law.

"The bloodhounds of slavery days are paralleled by the white watchmen and yellow highbinders now. Yet the chief of police testified that he went to the former for information in his tour of investigation.

"'Fugitive slaves' are advertised and hunted down the same now as in the days before the civil war, although now there is no fugitive slave law.

"The sale of slaves is advertised the same now as then; they are bought and sold like any personal property or merchandise; and sometimes they are owned in partnership. In one case, we have evidence that a dealer offered his own daughters for sale, and that their escape was not due to police vigilance.

"We had no difficulty in finding several white men able to read Chinese. All testified to having seen signs on houses in Chinatown announcing that slave girls were for sale for purposes of prostitution, and lottery, fan tan, and pi gow games. These signs were publicly displayed, to attract the attention of passers-by on the street. It is incomprehensible that the police could not have learned of their presence as easily as we did; it is hardly believable that they had not so learned. It is a fair presumption that the signs were displayed with the cognizance and, therefore, with the consent, of the police authorities.

"One child not more than two years old was brought before the grand jury, who had already been sold twice, and we have evidence that one infant was sold when 15 days old for \$110. Children of tender age are trained in domestic slavery, and kept in that condition of servitude until they are thirteen or fourteen years old, when they are placed in brothels.

"These slaves never receive a dollar for their earnings. All goes to their owners—that is, all that is left after the owners pay the landlords.

"The difficulty of landing Chinese women here since the exclusion law went into force has caused a scarcity of women, and the scarcer they become the more their bodies bring.

"The evidence is before us that a Chinaman was shot by highbinders for rescuing a girl a little over a year ago, to whom he is now married.

"A circular was printed and scattered broadcast through Chinatown warning whoever might desire to marry a girl who had been rescued that, unless a certain sum of money was paid to her owners, they would not be

responsible for the consequences—meaning that he would be murdered.

“Whenever a warrant is asked for with a view to the rescue of slave girls, information of the fact at once reaches the owner, so that, when the police arrive, the victim is missing.

“Not only for the sake of the slaves themselves do we plead and demand that some action be taken; but for the sake of our youth, so many of whom are lead into these dens of iniquity where lives are wrecked. The testimony, as quoted in the appendix, shows that when the women are afflicted with loathsome and deadly disease, they are confined to apartments for white men and boys only.”

These are not new conditions. They have always existed among the Chinese, who have no regard whatever for laws. A recent dispatch tells of a female cross between a Chinaman and white Sunday school teacher that had been sold in slavery and was rescued just as she was to be sent to China.

On the very day that the foregoing grand jury report came to the Commissioner's notice the Montana daily papers contained an account of the rescue of two female Chinese slaves in the city of Butte by a mission worker of San Francisco. These women, sisters, were held in absolute slavery by their owner, Chin Goon, at 21 East Galena street. They were kept in an inside room, unable to obtain a breath of fresh air, beaten with sticks, and compelled to lead a life of shame.

The existence of this most horrible life of slavery in our own State, as proven by the rescue of these girls, should arouse the people to a determined effort to put a stop to such infamy. The prevalent habits of concealment in underground rooms, which whites are not allowed to see or even to suspect, make this form of slave-holding very hard to detect, and unless the unfortunate victims can read and write English, as was the case with Chin Goon's two slaves, they are in all probability doomed to end their days in this most pitiful condition.

It is well that there are brave men and women who risk their lives in their efforts to rescue these poor creatures, but at the same time it is unfortunate that so many people unthinkingly make it possible for these heinous crimes to be practised in America by patronizing those who are responsible for them.

The laundryman or gardener who comes to your door may also be engaged in this nefarious business. One has no means of knowing. The clothing in which you wrap the tender form of your innocent babe may have been handled by a diseased, even leprous washerman, and in any event was dampened by mouth spraying, of which Prof. E. J. Dalton, of Boston, writes:

“Spraying from the mouth is another evil that should not be tolerated by any civilized community. The danger not only lies from bacteria that exists in the saliva of the oral cavity; there is also a parasite known as the caries, caused by the stagnation of depraved juices that adhere to the teeth. The Chinese are afflicted more by this micro-organism than any other nation, they being mostly a vegetable eating race, giving less exercise to the teeth and jaw bone. Out of an examination of 50 Chinese skulls, 21 were found afflicted with caries or on an average of forty and twenty one-hundredths, while out of an examination of twenty-six Anglo-Saxon skulls twelve were found afflicted with caries, or fifteen and seventy-eight one-hundredths.”

FREE PUBLIC EMPLOYMENT OFFICE.

Section 760 to 777, inclusive, of the Political Code of Montana, which provided for the establishment and maintenance of a Free Public Employment Office, under the supervision of the Commissioner of the Bureau of Agriculture, Labor and Industry, were repealed by the Fifth Legislative Assembly in 1897, experience having proven that the methods imposed by the law, were not effective in bringing the employer and the unemployed together with the necessary simplicity and celerity. In place of the above sections, however, the Fifth Assembly adopted another plan which, by actual experience in the city of Butte, has proven itself to be of practical value, and which, if carefully examined, will commend itself to other cities of the State as offering a satisfactory solution of a question that certainly is of sufficient importance to warrant thorough trial.

Section 776, Page 112 of the Session Laws of 1897, provides:

"It shall be lawful for the Common Council of any incorporated city within this State to provide for the establishment of a free public employment office, to be conducted on the most approved plans, and to provide for the expenses thereof out of the revenue of the city in which the same is established. The annual report of the Commissioner of the Bureau of Agriculture, Labor and Industry shall contain a detailed account of the transactions of all free employment offices within the State, showing the number of applicants for help, the number of applicants for employment, the number securing employment through said offices, and the expenses thereof."

Up to the present time the only city in the State that has established an employment office under the provisions of this act is Butte, although the subject has been agitated in a number of other places. The Butte office has been very successful, as the accompanying detailed report shows; but this is only a duplicate of the experience of every State which has tried the plan of maintaining these offices in different cities, bringing the applicants both for help and work into direct communication with each other.

It would be manifestly unjust to say that all private employment agencies are conducted in a dishonest or unscrupulous manner. Many of the proprietors are men of the highest character and probity. It cannot be denied, however, that the business is not, and cannot be restricted to men of this class. That under present conditions any person who is able to pay the required business license can engage in it, and the many complaints that are registered against the manner in which applicants for work are treated in some private agencies is sufficient ground for urging the establishment of public agencies wherever it is practicable to do so. The most flagrant case of victimizing that has been called to the attention of the Bureau was that of five men who had been sent out by the Northern Pacific Employment agency of St. Paul, to work in a smelter near Helena. The signed agreement which these men had called for employment at wages ranging from \$2.40 to \$3.00 a day of eight hours, and the return of twelve

dollars fare which they were required to pay before starting, if they remained in the employ of the smelter for 30 days.

Upon their arrival they were put to work as common laborers at \$1.80 and \$2.00 a day of 10 hours, and upon demanding the terms of their contract with the agency, they were discharged, thus losing, also, the \$12 railroad fare. Upon making complaint to the Bureau the Attorney General was consulted and it was his opinion that, as the crime, if any, had been committed in the state of Minnesota, the only redress the men had was to commence action against the agency in that state, as the proprietors stood between the smelter company and the men in any action for damages. This course to men who were absolutely penniless, hundreds of miles from home and friends, was, perforce, out of the question, and the men were compelled to swallow their wrongs. The Commissioner was able, after a few days, however, to secure employment for all of the men in another place, and it will probably be a long time before they trust themselves again to a private employment agency.

In another case a ticket was given to a man directing him to a place where he was to be employed as dishwasher, but after going compelled to walk from Marysville back to Helena, he produced his ticket endorsed, "This man cannot milk cows," by the party to whom he was sent.

It is but fair to say that the larger part of the fee was in this instance returned by the agent.

Two women who arrived in Helena, looking for work, were robbed by a man who represented himself as an employment agent and took all the money they had as a fee for securing them jobs. The man was arrested, convicted and sent to the penitentiary.

In the days when logging was done by contract instead of directly by the companies, as at present, it was customary for the contractors in the woods and the employment agencies to keep a constant procession of men coming and going along the roads to the lumber camps, necessitating long and weary tramps over rough roads, and the payment of camp prices for meals and lodging until the deluded applicant for work could get away. The decided stand which the lumbermen's union, assisted by the State Trades and Labor Council, took against this system, as well as the abolition of contract-letting by the big lumber companies has, to a great extent, done away with this practice. As to the State exercising supervision and control over private agencies, it is submitted that if such control is advisable and necessary, it only proves that the better plan is for the State to assume full charge through the establishment of city agencies, as provided for by the existing law, in which case it would be manifestly impossible for any injustice to be practiced upon a class of helpless citizens who, in most instances, can ill-afford to pay the fee exacted, as they almost invariably seek the employment office at the time of their greatest necessity.

The policy of maintaining free public employment agencies has passed the experimental stage. Under the law any citizen who is interested in the matter can prepare, or have prepared, an ordinance providing for the establishment of an agency in his own town, and have it introduced and

passed by the common council. In every city where there is a labor union this could be accomplished by concerted action and persistent agitation.

The cost of maintaining such an institution should only be estimated or considered by the results obtained. If one penniless, despairing woman was saved from suicide, or worse, by the establishment of such an institution, and placed in a position where she was able to earn an honest living, who would count the cost? The principle that it is the duty of the State to protect every citizen in his right to labor will, if carried to its logical conclusion, demonstrate that it is no less the duty of the State to provide the opportunity to labor, or even the labor itself.

But without entering into the economic features of the question, the people in the different cities are urged to follow the example of Butte and provide a place where all who wish the services of an employment agent can obtain them in a free office, conducted under the State law, absolutely without cost to themselves, and subject to none of the annoyances, misrepresentations or extortions of a private agency.

A few figures taken from the report of the free office in Seattle will not be judged out of place: The report shows that since March, 1894, places have been found for the unemployed to the number of 125,872 at a cost to the city of \$8,507.79, or six and three-quarter cents per place. These positions if secured through a private agency would have cost the applicants at least \$1.25 each, or \$157,240. During the year 1901 at an outlay of \$1,276.69 a total of 26,560 positions were filled, an expense of four cents and eight mills.

As provided in the law a detailed report of the business transacted in the Butte office is appended, and the Commissioner takes this opportunity of thanking the Employment Agent F. W. Cronin for his prompt and painstaking disposition toward this office.



A VIEW OF VIRGINIA CITY.

STATEMENT SHOWING THE TRANSACTIONS OF THE BUTTE FREE PUBLIC EMPLOYMENT OFFICE FROM THE DATE OF ITS OPENING, MARCH 10, 1902 to NOVEMBER 30, 1902.

MONTH	Applications for Work			Applications for Help			Positions Filled			Nature of Position Filled by Males			Nature of Position Filled by Females			Positions Filled in the City		Positions Filled Out of the City	
	Male	Fe- male	Total				Male	Fe- male	Total	Hotel and Res- taurant Help.	Laborers.....	Miscellaneous.	Hotel and Res- taurant Help.	Domestic	Miscellaneous.	Male	Fe- male	Male	Female
March 10 to 31.....	252	135	387	118	118	39	54	93	28	6	5	22	28	4	19	29	20	5	
April	95	128	223	297	297	139	96	235	71	57	11	41	47	8	91	93	48	3	
May	101	133	234	210	210	52	105	157	19	31	2	40	59	6	17	93	35	12	
June.....	176	103	279	274	274	127	86	213	52	64	11	31	49	6	84	74	43	12	
July	224	147	371	355	355	186	122	308	70	105	11	38	72	12	66	108	120	14	
August ..	265	262	527	417	417	191	163	354	69	114	8	59	94	10	117	12	74	151	
September	179	241	420	357	357	141	162	303	57	80	4	58	83	22	50	154	91	8	
October	165	228	393	323	323	120	172	292	36	74	10	54	101	17	42	160	78	12	
November	206	194	400	287	287	126	118	244	35	87	4	37	73	8	51	108	75	10	
Total	1,663	1,571	3,234	2,638	2,638	1,121	1,073	2,199	437	618	66	380	606	93	537	831	584	227	

The total expenses of the office since its opening, including furnishing, salaries and printing have been \$2,075.00.

DIRECTORY OF LABOR ORGANIZATIONS IN MONTANA.
ORGANIZATIONS AFFILIATED WITH THE AMERICAN LABOR UNION.
CENTRAL BODIES.

NAME	City or Town	Date of Organi ation	Elect Officers	Time of Meeting
GENERAL UNIONS:—				
Western Federation of Miners	Denver, Colorado .....	.....	.....	May each year.
Montana State Trades and Labor Council	Butte, Montana .....	.....	.....	August each year.
Cascade County District Union	Great Falls ....	.....	.....	Monthly.
Flathead County Trades and Labor Council	Kalispell ....	.....	.....	Monthly.
Lewis and Clarke County Trades and Labor Assembly	Helena .....	.....	.....	Every Friday night.
Western Montana Trades and Labor Council	Missoula ....	.....	.....	Monthly.
Silver Bow County Trades and Labor Assembly	Butte .....	.....	.....	Every Sunday evening.
Hand and Sheep Shearers Union	Butte .....	.....	.....
LOCAL UNIONS.				
BAKERS:—				
Bakers' Union No. 142.....	Anaconda	Dec. 8, 1900	June and Dec	2nd Sat. each mo. P. M.
Bakers' Union No. 7.....	Butte	June 16, 1898	June and Dec	Every Saturday eve.
Bakers' Union No. 125	Great Falls ..	Oct. 9, 1900	June and Dec	.....
BARTENDERS:—				
Bartenders' Protective Union No. 173	Anaconda	Aug. 15, 1901	June and Dec	2nd and 4th Tuesday.
Bartenders' Protective Union No. 127	Butte	Oct. 16, 1900	June and Dec	1st and 3d Friday.
Bartenders' Protective Union No. 221	Helena	Jan. 27, 1902	June and Dec	Thursday eve.
BARBERS:—				
Barbers' Protective Union No. 23....	Anaconda	Aug. 1898	June and Dec	1st and 3d Wednesday.
Barbers' Protective Union No. 137....	Billings ..	Dec. 7, 1900	June and Dec	1st and 3d Wednesday.
Barbers' Protective Union No. 21....	Butte ..	Aug. 1898	June and Dec	Monday eve.
Barbers' Protective Union No. 179....	Great Falls	Aug. 20, 1901	June and Dec	.....
Barbers' Protective Union No. 170....	Helena	Aug. 14, 1901	June and Dec	1st and 3d Tuesday.
Barbers' Protective Union No. 239....	Missoula	Apr. 7, 1902	June and Dec	.....

DIRECTORY OF LABOR ORGANIZATIONS—CONTINUED.

NAME	City or Town	Date of Organization	Elect Officers	Time of Meeting
BEER BOTTLERS AND DRIVERS:—				
Beer Bottlers' and Drivers' Union No. 171	Butte	July 17, 1901	June and Dec	.....
BLACKSMITHS AND HELPERS:—				
Blacksmiths' and Helpers' Union No. 144..	Anaconda	Feb. 12, 1901	June and Dec	.....
Blacksmiths' and Helpers' Union No. 77	Butte..	Dec. 6, 1899	June and Dec	Every Tuesday eve.
BREWERS:—				
Brewers' Union No. 80	Butte	Jan. 15, 1900	June and Dec	.....
BRICKMAKERS:—				
Brickmakers' Union No. 28	Anaconda	Aug. 1898	June and Dec	2nd and 4th Wednesday.
BUTCHERS:—				
Butchers' Union No. 22.....	Anaconda	Aug. 2, 1898	June and Dec	2nd and 4th Wednesday.
Butchers' Union No. 17.....	Butte	Aug. 1898	June and Dec	.....
CARMEN:—				
Carmens' Union No. 36	Butte	Dec. 1898	June and Dec	2nd and 4th Monday.
CLERKS:—				
Clerks' Protective Union No. 35.....	Anaconda	Feb. 8, 1900	June and Dec	1st and 3d Friday ea. mo.
Clerks' Protective Union No. 12	Butte	July 1898	June and Dec	Monday eve.
Clerks' Protective Union No. 193	Great Falls	Sept. 26, 1901	June and Dec	2nd and 4th Thurs. ea. mo
Clerks' Protective Union No. 209	Kalispell	Dec. 22, 1901	June and Dec	.....
Clerks' Protective Union No. 85	Missoula	Feb. 14, 1900	June and Dec	.....
FARMERS:—				
Farmers' Union of Montana, No. 298..	Missoula	Oct. 21, 1902	June and Dec	.....
FEDERAL LABOR:—				
Federal Labor Union No. 133	Billings..	Nov. 24, 1900	June and Dec	Every Thursday eve.
Federal Labor Union No. 135	Bonita	Dec. 2, 1900	June and Dec	.....
Federal Labor Union No. 48	Clinton	Jan. 28, 1899	June and Dec	.....
Federal Labor Union No. 145	Columbus	Feb. 26, 1901	June and Dec	2nd and 4th Monday.

DIRECTORY OF LABOR ORGANIZATIONS—CONTINUED.

NAME	City or Town	Date of Organization	Elect Officers	Time of Meeting
Federal Labor Union No. 260	Elliston	June 11, 1902	June and Dec	.....
Federal Labor Union No. 18	Great Falls	July 1898	June and Dec	.....
Federal Labor Union No. 199	Helena	Oct. 22, 1901	June and Dec	Monday eve.
Federal Labor Union No. 175	Kalispell	Aug. 15, 1901	June and Dec	Thursday eve.
Federal Labor Union No. 302	Marysville	Oct. 31, 1902	June and Dec	.....
Federal Labor Union No. 43	Missoula	Nov. 1894	June and Dec	Tuesday eve.
GARMENT WORKERS' UNION:— Garment Workers' Union No. 278	Helena	Aug. 9, 1902	June and Dec	2nd Thursday each month
HACKDRIVERS' UNIONS:— Hackmens' Protective Union No. 185. Hack and Cab Drivers' Union No. 218	Butte	Sept. 11, 1901	June and Dec	2nd and 4th Monday.
	Helena	Jan. 21, 1902	June and Dec	.....
HOTEL AND RESTAURANT EMPLOYEES:— Hotel and Restaurant Employees Union No. 3.... .. Hotel and Restaurant Employees Union No. 2.... .. Hotel and Restaurant Employees Union No. 285	Anaconda	June 16, 1898	June and Dec	Monday eve.
	Butte	July 1898	June and Dec	Monday eve.
	Great Falls	Aug. 30, 1902	June and Dec	.....
	Helena	Oct. 7, 1900	June and Dec	Tuesday eve.
	Missoula	Nov. 5, 1901	June and Dec	2d and last Thurs. ea. mo
LABOR UNIONS:— Labor Union No. 156	Lewistown	May 5, 1901	June and Dec	Wednesday eve.
	Quartz	June 2, 1899	June and Dec	Alternate Sundays.
	Red Lodge	Oct. 4, 1899	June and Dec	Thursday eve.
	Kendall	Apr. 18, 1902	June and Dec	.....
	Superior	July 30, 1899	June and Dec	Alternate Sundays.
LAUNDRY WORKERS:— Laundry Workers' Union No. 225	Billings	Feb. 24, 1902	June and Dec	.....
	Butte	July 1898	June and Dec	2d and 4th Tues. ea. mo.
	Helena	Mar. 8, 1902	June and Dec	.....

DIRECTORY OF LABOR ORGANIZATIONS—CONTINUED.

NAME	City or Town	Date of Organization	Elect Officers	Time of Meeting
LUMBERMEN:—				
Big Blackfoot Lumbermen's Union No. 47	Bonner ..	Feb. 1899	June and Dec	Every Wednesday eve.
Deer Creek Lumbermen's Union No. 161	DeBorgia	May 21, 1901	June and Dec	Weekly.
Blodgett Creek Lumbermen's Union No. 287	Hamilton	Sept. 13, 1902	June and Dec	.....
Sawtooth Lumbermen's Union No. 109	Hamilton	Aug. 7, 1900	June and Dec	Saturday eve.
Huson Lumbermen's Union No. 16.....	Huson	July 20, 1898	June and Dec	1st and 3d Sunday ea. mo.
Whitfish Lumbermen's Union No. 265	Lasalle	Nov. 18, 1901	June and Dec	.....
Lathrop Lumbermen's Union No. 108.	Lathrop	July 30, 1900	June and Dec	Sunday P. M.
St. Regis Lumbermen's Union No. 50	Riberdy	Feb. 22, 1899	June and Dec	Sunday P. M.
Nine Mile Lumbermen's Union No. 41	Stark	July 27, 1901	June and Dec	Sunday P. M.
Stevensville Lumbermen's Union No. 198	Stevensville	Oct. 13, 1901	June and Dec	.....
Victor Lumbermen's Union No. 279...	Victor	Aug. 8, 1902	June and Dec	.....
MACHINISTS:—				
Machinists' Union No. 79	Butte	Dec. 14, 1899	June and Dec	.....
MESSENGER BOYS:—				
Messenger Boys Union No. 295	Great Falls	Oct. 2, 1902	June and Dec	.....
MUSICIANS:—				
Musicians' Mutual Protective Union No. 168	Anaconda ..	July 3, 1901	June and Dec	Last Tuesday each mo.
Musicians' Mutual Protective Union No. 51	Butte	Feb. 21, 1899	June and Dec	Monthly.
Orchestral Protective Union No. 89 ..	Great Falls ..	Mar. 5, 1900	June and Dec	2nd Sunday each month.
Musicians' Union No. 96	Missoula	Mar. 16, 1900	June and Dec	Monthly.
PAINTERS AND DECORATORS:—				
Painters' and Decorators' Union No. 30.....	Butte	Aug. 26, 1896	June and Dec	Thursday eve.
ROPEMEN:—				
Ropemen's Union No. 184	Butte	Sept. 8, 1901	June and Dec	.....
SHOEMAKERS:—				
Shoemakers' Union No. 24	Anaconda	July 27, 1898	June and Dec	1st Tuesday each month.

DIRECTORY OF LABOR ORGANIZATIONS—CONTINUED.

NAME	City or Town	Date of Organization	Elect Officers	Time of Meeting
Shoemakers' Union No. 27	Butte	Aug. 1898	June and Dec	2nd and 4th Monday.
STABLEMEN:—				
Stablemen's Union No. 157	Butte	May 13, 1901	June and Dec	.....
Stablemen's Union No. 286	Great Falls	Aug. 30, 1902	June and Dec	.....
STATIONARY ENGINEERS:—				
Stationary Engineers Union No. 223..	Missoula	Feb. 14, 1902	June and Dec	.....
STENOGRAPHERS:—				
Stenographers' Union No. 149	Butte ..	Mar. 29, 1901	June and Dec	Friday eve.
TEAMSTERS:—				
Teamsters' and Stablemen's Union No. 190	Anaconda	Sept. 20, 1901	June and Dec	Thursday eve.
Teamsters Union No. 15	Butte....	July 20, 1898	June and Dec	Saturday eve.
Teamsters' and Drivers' Union No. 177	Helena	Aug. 14, 1901	June and Dec	Friday eve.
THEATRICAL USHERS:—				
Theatrical Ushers' Union No. 202	Butte	Oct. 26, 1901	June and Dec	Alternate Sundays.
TIN, SHEET IRON AND CORNICE WORKERS:—				
Tin, Sheet Iron and Cornice Workers' Union No. 143	Butte	Feb. 5, 1901	June and Dec	2nd and 4th Tuesday.
WOMEN'S PROTECTIVE:—				
Women's Protective Union No. 192...	Anaconda	Sept. 24, 1901	June and Dec	.....
Women's Protective Union No. 148 ...	Butte	Mar. 29, 1901	June and Dec	Every Thursday eve.
WORKINGMENS':—				
Workingmen's Union No. 5	Butte	June 16, 1898	June and Dec	Friday eve.
Workingmen's Union No. 172	Livingston	July 29, 1901	June and Dec	Monday eve.
WOOD, WIRE AND METAL LATHERS:—				
Wood, Wire and Metal Lathers' Union No. 128	Great Falls	Oct. 16, 1900	.....	.....

DIRECTORY OF LABOR ORGANIZATIONS—CONTINUED.
NOT AFFILIATED WITH A. L. U. OR A. F. OF L.

NAME	City or Town	Date of Organization	Elect Officers	Time of Meeting
Bricklayers', Masons' and Plasterers' Union No. 1	Butte ..	.....	.....	.....
Bricklayers', Masons' and Plasterers' Union No. 2.....	Anaconda ..	Oct. 8, 1892	June and Dec	Every Tuesday.
Bricklayers', Masons' and Plasterers' Union No. 3	Great Falls	.....1891	June and Dec	Every Wednesday.
Bricklayers', Masons' and Plasterers' Union No. 4.....	Helena.....	May 29, 1891	June and Dec	2nd and 4th Tuesday.
Bricklayers', Masons' and Plasterers' Union No. 6.....	Helena	Mar. 2, 1895	June and Dec	2nd and 4th Friday.
Bricklayers', Masons' and Plasterers' Union No. 8.....	Kalispell ..	Aug. 1, 1902	June and Dec	.....
Bricklayers', Masons' and Plasterers' Union No. 7.....	Missoula ..	June 30, 1897	June and Dec	Alternate Saturday.
OPERATIVE PLASTERERS:—				
Operative Plasterers' Union No. 119	Butte	June 1, 1895	Apr. and Oct.	Every Tuesday.
Operative Plasterers' Union No. 83..	Helena	June 23, 1890	Jan. and July	1st and 3d Wednesday.
Operative Plasterers' Union	Missoula ..	Nov. 1902	Jan. and July	.....

ORGANIZATIONS AFFILIATED WITH THE WESTERN FEDERATION OF MINERS.

NAME	City or Town	Date of Organization	Time of Meeting	Elect Officers
Aldridge Miners' Union No. 57	Aldridge	Apr. 19, 1897	Every Saturday night ..	Mar. and Sept.
Barker Miners' Union No. 12	Barker .....	.....	Every Thursday night ..	Mar. and Sept.
Basin Miners' Union No. 23	Basin	June 24, 1894	1st and 3d Wed. night ..	Mar. and Sept.
Belt Mountain Miners' Union No. 7....	Neihart	June 16, 1895	Every Saturday night ..	Mar. and Sept.
Butte Miners' Union No. 1.....	Butte .....	.....	Every Tuesday night ..	Mar. and Sept.
Elkhorn Miners' Union No. 88	Elkhorn	Apr. 13, 1901	Every Saturday night ..	Mar. and Sept.
Granite Miners' Union No. 4.....	Granite	Sept. 28, 1888	Every Tuesday night ..	Mar. and Sept.
Hassel Miners' Union No. 35	Hassel	June 25, 1895	Every Friday night	Mar. and Sept.
Horr Miners' Union No. 54	Horr	July 29, 1900	Every Saturday night ..	Mar. and Sept.
Jardine Miners' Union No. 133	Jardine	Oct. 31, 1901	Every Friday night	Mar. and Sept.

DIRECTORY OF LABOR ORGANIZATIONS—CONTINUED.
ORGANIZATIONS AFFILIATED WITH THE WESTERN FEDERATION OF MINERS.

NAME	City or Town	Date of Organization	Time of Meeting	Elect Officers
Judith Mountain Miners' Union No. 107	Maiden	Oct. 11, 1900	Every Saturday night	Mar. and Sept.
Marysville Miners' Union No. 103	Marysville	Aug. 14, 1900	Every Saturday night	Mar. and Sept.
Mayflower Miners' Union No. 105	Whitehall	.....	Every Tuesday night	Mar. and Sept.
Mount Helena Miners' Union No. 133	Helena	Oct. 19, 1901	Every Saturday night	Mar. and Sept.
Norris Miners' Union No. 104	Norris	.....	Every Saturday night	Mar. and Sept.
North Moccasin Miners' Union No. 111	Kendall	.....	Every Saturday night	Mar. and Sept.
Pony Miners' Union No. 131	Pony	Sept. 11, 1901	1st and 3d Monday night	Mar. and Sept.
Winston Miners' Union No. 25	Winston	July 18, 1894	4th Saturday night	Mar. and Sept.
Virginia City Miners' Union No. 129	Virginia City	Sept. 7, 1901	2d and 4th Sat. night	Mar. and Sept.
WESTERN FEDERATION OF MINERS, MILL AND SMELTER-MEN:—				
Anaconda M. and S. No. 117	Anaconda	.....	Every Saturday night	Mar. and Sept.
Butte M. and S. No. 74	Butte	.....	Every Wednesday night	Mar. and Sept.
East Helena M. and S. No. 126	East Helena	Aug. 24, 1901	Every Wednesday night	Mar. and Sept.
Granite M. and S. No. 162	Granite	.....	.....	.....
Great Falls M. and S. No. 16	Great Falls	.....	Every Saturday night	Mar. and Sept.
WESTERN FEDERATION OF MINERS—ENGINEERS:—				
Anaconda Sta. Eng. No. 114	Anaconda	Mar. 11, 1901	Every Monday night	Mar. and Sept.
Butte Sta. Eng. No. 83	Butte	.....1890	Every Wednesday night	Mar. and Sept.
Granite Sta. Eng. No. 86	Granite	Jan. 31, 1899	Alternate Monday night	Mar. and Sept.

ORGANIZATIONS AFFILIATED WITH THE UNITED MINE WORKERS OF AMERICA.

Bridger Miners' Union No. 1340	Bridger	July 8, 1902	Sunday 10 a. m.	June and Dec.
Chestnut Miners' Union No. 2046	Chestnut	July 12, 1902	Every Saturday night	June and Dec.
Red Lodge Miners' Union No. 1771	Red Lodge	Sept. 27, 1901	Every Friday night	June and Dec.
Sand Coulee Miners' Union No. 2220	Sand Coulee	June 21, 1902	Every Saturday night	June and Dec.

DIRECTORY OF LABOR ORGANIZATIONS—CONTINUED.
ORGANIZATIONS AFFILIATED WITH THE AMERICAN FEDERATION OF LABOR.

NAME OF ORGANIZATION	Town	Date of Organization	Elect Officers	Date of Meetings
Bakers' and Confectioners' Int'l Union, Journeymen No. 149	Great Falls	July 20, 1901	June 30.....	First and third Saturday.
Beer Drivers' and Bottlers Union No. 231	Butte	Feb. 21, 1901	Jan. and July	2nd and 4th Wednesday.
Beer Drivers' and Bottlers' Branch No. 231	Anaconda .....	.....	.....	.....
Beer Drivers' and Bottlers' Branch No. 231	Billings .....	.....	.....	.....
Beer Drivers' and Bottlers' Branch No. 231	Great Falls .....	.....	.....	.....
Beer Drivers' and Bottlers' Branch No. 231	Helena	Sept. 1, 1901	Jan. and July	2nd Saturday each month
Brewers' Union No. 66	Butte	May 15, 1891	Dec. and June	1st and 3rd Saturday.
Brewers' Union Branch No. 66	Anaconda	Mar. 25, 1891	Apr. and Oct.....	Second Sunday.
Brewers' Union Branch No. 66	Great Falls	July 17, 1897	June and Dec.....	Twice a month.
Brewers' Union Branch No. 66	Helena	Jan. 1, 1899	Jan. and July	Last Saturday in month.
Brewers' Union Branch No. 66	Kalispell	June 1, 1901	Jan. and June	1st and 3rd Saturday.
Brewers' Union Branch No. 66	Missoula	May 1897	Jan. and June	Saturday, monthly.
Building Laborers Int. Prot. of A. No. 3	Anaconda	Apr. 10, 1896	April.....	Twice a month.
Building Laborers Int. Prot. of A. No. 1	Butte .....	.....1892	Last meeting each quar..	Tuesday.
Building Laborers Int. Prot. of A. No. 4	Helena	Apr. 13, 1899	June and Dec	Alternate Thursday.
Carpenters and Joiners United Brotherhood No. 88	Anaconda	May 16, 1889	June and Dec.....	Thursday eve.
Carpenters and Joiners United Brotherhood No. 256	Belt	Oct. 26, 1894	June and Dec	Wednesday eve.
Carpenters and Joiners United Brotherhood No. 112	Butte	Feb. 22, 1890	June and Dec	Thursday eve.
Carpenters and Joiners United Brotherhood No. 286	Great Falls	Nov. 26, 1890	June and Dec.....	Wednesday eve.
Carpenters and Joiners United Brotherhood No. 923	Havre .....	.....1901	June and Dec.....	Monday eve.
Carpenters and Joiners United Brotherhood No. 153	Helena	Mar. 25, 1899	June and Dec	1st and 3d Saturday eve.
Carpenters and Joiners United Brotherhood No. 911	Kalispell .....	.....1901	June and Dec..	.....
Carpenters and Joiners United Brotherhood No. 816	Lathrop	May 10, 1901	June and Dec....	First Monday each month

DIRECTORY OF LABOR ORGANIZATIONS—CONTINUED.

NAME OF ORGANIZATION	Town	Date of Organization	Elect Officers	Date of Meetings
Carpenters and Joiners United Brotherhood No. 28	Missoula	Feb. 1894	June and Dec.	Friday evening.
Clerks-Retail Nat. Prot. Union No. 171.	Havre		Jan. and July.	1st and 3d Friday.
Clerks-Retail Nat. Prot. Union No. 684.	Helena	Aug. 1902	June and Dec.	2d and 4th Monday.
Clerks-Retail Nat. Prot. Union No. 209.	Kalispell	Dec. 22, 1901	June and Dec.	Weekly.
Cigarmakers International Union No. 361	Anaconda	June 1895	June and Dec.	1st Sturday each month.
Cigarmakers International Union No. 362	Butte	Oct. 1894	June and Dec.	1st Tuesday each month.
Cigarmakers International Union No. 209	Great Falls		June and Dec.	1st Monday each month.
Cigarmakers International Union.	Livingston			
Electrical Workers Int. Bro. of, Union No. 65	Butte	Nov. 26, 1896	June and Dec.	2d and 4th Tuesday.
Electrical Workers Int. Bro. of, Union No. 122.	Great Falls	June 3, 1900	June and Dec.	Every Tuesday.
Engineers Nat. Ass'n of Stationary.	Helena			
Engineers Nat. Ass'n of Stationary.	Butte			
Engravers-Photo, Int. Typo. Union No. 25	Anaconda	Mar. 17, 1901	March	1st Sunday each month.
Granite Cutters' Int. Union	Baxendale		Feb. and Aug.	Every month.
Granite Cutters' Int. Union	Butte	Apr. 1, 1898	Feb. and Aug.	4th Sunday.
Granite Cutters' Int. Union	Helena	Mar. 1877	Feb. and Aug.	3d Saturday.
Horseshoers Int. Union No. 83	Butte	Jan. 1, 1898	Jan.	1st and 3d Wednesday.
Iron Molders Int. Union of, No. 309.	Anaconda	Jan. 2, 1892	June and Dec.	1st and 3d Fridays.
Iron Molders Int. Union of, No. 276.	Butte	Aug. 2, 1890	June and Dec.	3d Thursday each month.
Iron Molders Int. Union of, No. 93.	Great Falls	Jan. 11, 1900	June and Dec.	2d Monday each month.
Machinists' Int. Ass'n of, No. 88.	Butte	June 1889	December.	Monday night.
Machinists' Int. Ass'n of, No. 287.	Great Falls	July 1899	December	
Machinists' Int. Ass'n of, No. 168.	Livingston		December	
Machinists' Int. Ass'n of, No. 99	Missoula	Aug. 22, 1902	December	
Musicians Am. Fed. of Union No. 81.	Anaconda	Nov. 1898	Jan. and July.	2d Tuesday each month.
Painters, Decorators and Paperhangers Brotherhood of, No. 182	Anaconda	June 1, 1896	June and Dec.	2d and 4th Tuesday.
Painters, Decorators and Paperhangers Brotherhood of, No. 212	Butte	Aug. 22, 1896	June and Dec.	Thursday.
Painters, Decorators and Paperhangers Brotherhood of, No. 260	Great Falls	Mar. 15, 1887	June and Dec.	Thursday.

DIRECTORY OF LABOR ORGANIZATIONS—CONTINUED.

NAME OF ORGANIZATION	Town	Date of Organization	Elect Officers	Date of Meetings
Painters, Decorators and Paperhangers Brotherhood No. 745	Kalispell	Aug. 4, 1902	June and Dec .....	.....
Printing Pressmen's Int. of N. A. No. 21	Butte	Aug. 1, 1897	Jan. and July	1st Sunday each month.
Printing Pressmen's Int. of N. A. No. 9	Helena	Nov. 25, 1888	Jan. and July	1st Tuesday each month.
Plumbers-S. & G. F. Journeymen of U. S. and Canada No. 41	Butte	Aug. 2, 1890	June and Dec	Weekly.
Plumbers-S. & G. F. Journeymen of U. S. and Canada No. 139	Great Falls	Aug. 18, 1894	June and Dec	Monday.
Tailors Journeymen of A. No. 151	Anaconda	Oct. 1895	Jan. and July	1st Monday each month.
Tailors Journeymen of A. No. 25	Butte	Sept. 8, 1883	April and Oct	1st Monday each month.
Tailors Journeymen of A. No. 43	Great Falls	Oct. 1, 1891	Jan. and July .....	.....
Tailors Journeymen of A. No. 265	Helena	Sept. 10, 1900	Jan. and July	2d Monday each month.
Theatrical Stage Employees Union	Butte	Aug. 15, 1902	June and Dec	2d and 4th Sunday.
Typographical Int. Union No. 255	Anaconda	Oct. 1889	Jan. and July	1st Sunday, P. M.
Typographical Int. Union No. 398	Billings	Oct. 1900	Jan. and July	1st Sunday, P. M.
Typographical Int. Union No. 126	Butte .....	.....	June and Dec	1st Sunday, P. M.
Typographical Int. Union No. 256	Great Falls	Nov. 7, 1899	Jan. and July	1st Sunday, P. M.
Typographical Int. Union No. 95	Helena	July 1, 1883	Jan. and July	1st Sunday, P. M.
Typographical Int. Union No. 277	Missoula .....	.....	1893 July	1st Sunday, P. M.
Wood, Wire and Metal Lathers Int. Union No. 69	Butte	Mar. 1900	Jan. and July	Tuesday eve.
Wood Workers Amal. Int. of A. Union	Butte	Feb. 28, 1901	Jan. and July	1st and 3d Tuesday.

RAILROAD ORGANIZATIONS.

CONDUCTORS—Order of Railway—				
Black Eagle O. R. C. No. 356	Great Falls	Aug. 19, 1896	2d and 4th Sunday	December each year.
Butte City O. R. C. No. 29	South Butte	Oct. 18, 1891	2d and 4th Sunday	December each year.
Livingston O. R. C. No. 371	Livingston	July 1, 1895	1st and 3d Tuesday	November each year.
Montana O. R. C. No. 272	Havre	Jan. 21, 1891	1st and 3d Sunday	November each year.
Missoula O. R. C. No. 243	Missoula .....	.....	1st Sunday	November each year.
Yellowstone O. R. C. No. 191	Glendive	Mar. 11, 1886	1st and 3d Wednesday	November each year.
ENGINEERS—Bro. of Locomotive—				
Division No. 274	Butte	June 1885	1st and 3d Saturday	June each year.
Division No. 195	Forsyth	Sept. 28, 1882	Wednesday, P. M.	March each year.

DIRECTORY OF LABOR ORGANIZATIONS—CONTINUED.

NAME OF ORGANIZATION	Town	Date of Organization	Time of Meeting	Elect Officers
Division No. 504	Great Falls .....	.....1890	Sunday, P. M.	April each year.
Division No. 499	Kalispell ....	.....1892	2d and 4th Wednesday ..	April each year.
Division No. 258	Missoula .....	.....1884	1st Sunday	April each year.
FIREMEN—Bro. of Locomotive—				
Beaver Canon Lodge No. 493	Lima	Dec. 9, 1896	1st and 3d Monday	June each year.
Copper City Lodge No. 500	Anaconda	Dec. 7, 1896	2d and 4th Thursday	June each year.
Custer Lodge No. 191	Livingston	Dec. 29, 1883	Wednesday evening	June each year.
J. K. Galbreath Lodge No. 261	South Butte	Apr. 5, 1885	1st and 3d Wednesday	June each year.
Landmark Lodge No. 128	Glendive ....	.....1882	Sunday evening	June each year.
Mount Helena Lodge No. 423	Helena ....	.....1889	1st and 3d Friday	June each year.
Silver State Lodge No. 517	Clancy	Nov. 30, 1896	Sunday afternoon	June each year.
Sun River Lodge No. 456	Great Falls .....	.....	Sunday evening	June each year.
Lodge No. 194	Missoula .....	.....	.....	.....
Lodge No. 482	Kalispell .....	.....	.....	.....
SWITCHMEN—International Union of				
Copper City Lodge No. 48	South Butte .....	.....	.....	.....
Missoula Lodge	Missoula ....	.....	.....	.....
Great Falls Lodge	Great Falls .....	.....	.....	.....
TELEGRAPHERS—Order of Railroad				
Northern Pacific Division No. 54	Dorsey ....	.....1899	At call of chairman	May, biennially.
TRAINMEN—Bro. of Railroad—				
Eagle Butte Lodge No. 328	Glendive ....	.....1883	Thursday night	January each year.
Mountain City Lodge No. 313	Kalispell	May 1892	Sunday night	December each year.
National Park Lodge No. 294	Livingston	Jan. 25, 1897	1st and 3d Sunday night ..	December each year.
Sun River Lodge No. 405	Great Falls	May 18, 1891	Sunday	May each year.
T. J. Sheahan Lodge No. 293	Missoula .....	.....1889	1st and 3d Thurs. night ..	December, biennially.

THE INDUSTRIES.

MINERAL PRODUCTION.

A study of the details of mineral production of Montana is hardly less interesting than instructive. A knowledge of the methods employed, the results accomplished, in what has been, is now and for some time to come will continue to be, the State's chief industry, is of importance to all classes of citizens. Upon its prosperity and success the business men and working men alike depend to a large extent in making calculations for the future. Gain or loss in the total output represents either success or failure to both. The decline of the last two years in the values of the yearly output can in no way be attributed to a failure in either mines or methods, but rather to specific causes which are understood throughout the State. Notwithstanding that silver is only mined as a by-product, \$18,334,443 worth of silver, coining value, was produced during the year 1901, a decrease of but \$147,768 under the previous year. The output of copper suffered a decrease of \$3,075,298 as compared with the year 1900, and \$4,190,069 as compared with the year 1899, which was the banner copper year for the State, the total yield for that year having been \$40,941,906 and for 1901 it was \$36,751,837. The most prominent causes which have led to a falling off in the production of copper during the past two years are first, the understood policy of the copper owners of the world to restrict production, and, second, the closing down of several large producers by order of the courts, which, perhaps, is the most important factor in lessening production. As a result of the lawsuits and counter suits the Nipper, Schweizer and Parnell mines have been closed. The Minnie Healy, which yielded a daily output of 800 tons of ore, nearly half of this amount said to be first-class, is now idle by order of court. The Cora is enjoined from working the southerly veins of the claim. All these are owned by the Montana Ore Purchasing Company. The Snohomish and Tramway mines, owned jointly by the Butte & Boston and the Montana Ore Purchasing Company, are being worked only in a desultory way by a receiver. The Boston and Montana Company is restrained from working the Leonard mine, one of its richest and largest properties, and also the largest veins in the Pennsylvania. The Michael Devitt, a Butte & Boston property, is idle. The Speculator, owned by the Largey estate, is under injunction.

The total abolition of Sunday work by the mining companies is a loss in production, but contrary to the predictions of some, it appears to be a remarkable fact that neither the returns to the assessor upon the net proceeds of the mines nor the sworn statement of the Superintendent of the Anaconda Copper Mining Company show that the eight-hour work day in mines and smelters has appreciably increased the cost of producing copper.

The mining future is particularly bright. New districts of magnitude

and splendid values are constantly being developed. There is a healthy, active inquiry for mining properties from parties controlling capital sufficient to work them upon a large scale. The introduction of electrical power in the mines and smelters of Butte has proven a great saving in working expenses. A new coal prospect that bears every promise of developing into a valuable mine, located within a mile of the city of Anaconda, will, if expectations are realized, furnish the works at that place with an abundance of cheap fuel. An advance in the market price of silver, confidently predicted by those whose statements entitle them to credit, would mean a speedy re-



EXTERIOR VIEW OF GILT EDGE MILL AT GILT EDGE.

sumption of work in dozens of abandoned mines and smelters throughout the State. The cyanide and other processes of handling low-grade ores are coming into more general use, augmenting the production of gold and replacing in a great degree the loss occasioned by the abandonment of the old-time placer mines which yielded such fabulous returns in the early days. Dredges are also playing an important part in gold production, they being used in placer ground to move the gold-bearing earth in quantities at a minimum cost.

The total value of metal yielded by all the mines in the State to the present time amounts to the enormous sum of \$1,001,782,177. Prior to 1881, in the "early days" of the territory, lawlessness was so prevalent that lawlessness itself in the form of the "vigilantes" was invoked to preserve order,

and during that time the record is necessarily faulty, but that the amount is rather under than over the actual output can hardly be doubted.

The early figures are those supplied by express companies and banks that were doing business in the camps at the time, and while they doubtless handled the larger part of the product, assuredly they did not get it all. And still, the record is a wonderful one. Many of the world's mighty enterprises can trace their origin to the golden stream that had its source in Montana's treasure houses. First in copper, second in silver, and fifth in the production of gold in the United States, Montana is justly proud of her rank in the mineral producing territories of the world. A resumption of silver mining would quickly place her in the front rank of production of that metal and she is also destined to advance as a gold producer.

There are various sources from which the figures of the total output of precious metals are compiled, but it has always been the custom of the Bureau, for the sake of uniformity, to rely upon those furnished by the Assayer in Charge of the United States Assay Office at Helena as being the best of any that could be procured. The reports of Hon. B. H. Tatem, present assayer in charge, are accordingly submitted below.

For a detailed description of the mines and their location the reader is referred to the report of the Hon. John Byrne, State Inspector of Mines.

REPORT OF HON. B. H. TATEM FOR THE YEAR 1900.

(Assayer in Charge United States Assay Office, Helena.)

The value of the gold, silver, copper, and lead recovered from mining during the calendar year 1900 aggregated \$63,746,726.91 in value, and was distributed to the several metals in the following quantities and amounts:

Description.	Quantity.	Value.
Gold, fine ounces	229,114.882	\$4,736 224.95
Silver, fine ounces	14,294,835.11	*18,482,211.05
Copper, (at \$16.19 per hundred weight) fine pounds	245,998,365	39,827,135.29
Lead, (at \$4.37 per hundred weight), fine pounds	16,044,751	701,155.62
Total value		\$63,746,726.91

* Coining value.

The prices at which both copper and lead are figured above were the average New York selling prices for these metals. When compared with the production in the year 1899 a slight decrease is to be noted in each of the metals, the difference being shown in the table:

Metals.	1899.		1900.		Decrease.
	Quantity.	Value.	Quantity.	Value.	
Gold, fine ozs..	233,126.717	\$4,819,156.95	229,114.882	\$4,736,224.95	\$82,932.00
Silver, fine ozs.	16,850,754.85	*21,786,834.52	14,294,835.11	*18,482,211.05	3,304,623.47
Copper, fine lbs	245,602,314	40,941,905.74	245,998,365	39,827,135.29	1,114,770.45
Lead, fine lbs ..	20,344,750	909,410.33	16,044,751	701,155.62	208,254.71
Total		\$68,457,307.54		\$63,746,726.91	4,710,580.63

* Coining value.

The total decrease in the values is equal to 7 per cent. Nearly all of this amount occurred in silver. This was due to the closing down of the works and mines at Elkhorn, to the steadily diminishing output of silver-lead ores in the State, to smaller silver contents in the copper ores of the Butte district, and to a lessening output of silver by the mills of the State. The exhaustion of ore at several of the mines heretofore prominent as large producers explains the decrease in gold. In copper the loss in value was due to a lower average price for this metal during 1900 than in 1899, the quantity of copper having increased somewhat.

Lead mining in Montana is at present of minor importance. In 1900 the mining of this metal in Beaverhead, Broadwater, Cascade, Flathead, and Meagher counties showed either no improvement or a decrease from the operations of the preceding year.

Notwithstanding the decreases noted above, the mining industry in the State is in a flourishing condition, and the promise for the future is fully as encouraging as at the close of the preceding year. However, the eight-hour law was a feature of the political campaign in 1900, and, having been a successful issue at the polls, an uncertainty characterizes mining operations. Until the contemplated legislation is enacted and its operation tried, the advancement of the mining industry must at least be hindered temporarily. This embarrassment, however, is no reflection on the real merit of the natural abilities of the properties themselves when not interfered with.

The gold that was won in 1899 and 1900 originated from the sources indicated in the table below, and in quantities and values specified:

Classification.	1899		1900.		Increase	Decrease
	Quantity.	Value.	Quantity.	Value.		
	Fine ounces		Fine ozs.			
Placer bullion..	28,827.617	\$595,919.73	26,709.214	\$552,128.45	.....	\$43,791.28
Mill bullion ...	64,070.159	1,324,447.73	70,350.342	1,454,270.64	\$129,822.91	.....
Cyanides	38,247.583	790,647.71	42,923.697	887,311.57	96,663.86	.....
Copper ores.....	55,706.317	1,151,551.77	54,252.098	1,121,490.40	.....	30,061.37
Lead ores	7,815.539	161,561.53	7,918.601	163,693.10	2,131.57	.....
In smelting ores	38,459.502	795,028.48	26,960.877	557,330.79	.....	237,697.69
Total	233,126.717	4,819,156.95	229,114.882	4,736,224.95	228,618.34	311,550.34

The gold taken from the placers of Montana amounted to 11.66 per cent of the total production, having been the result of operations more or less extensive in the several parts of the State where mining prevailed. There are extensive deposits of auriferous gravel upon which large operations are contemplated, but these can only be brought to profitable operation by the expenditure of considerable sums of money under intelligent and efficient direction for ditches, flumes, drains, and machinery. The gain in mill bullion during 1900 came from the development of a class of ores in the State suited to such operations and the equipment of the same with the necessary facilities for the treatment of this class of the product and the saving of the contained values.



WEST COLUSA MINE, BUTTE

The gain of nearly \$100,000 from material treated at the several cyaniding plants in the State indicate that this process can be operated successfully on the ores of the State and that its employment is attended with profitable results. Its use is under consideration at properties where it has not heretofore been employed, and the coming year will probably witness the establishment of additional works for the saving of values. The gold taken from the copper ores of the State in 1900 shows practically no change, the amount of gold per ton in the ores reduced having been about the same during each of these years. From lead ores the gold produced varied little in 1900 from the yield of 1899, and the falling off in the amount taken at the smelters from dry ores and concentrates was principally due to the smaller output of these ores throughout the State.



WATSEKA MILL, ROCHESTER, MADISON COUNTY.

The amounts of silver for the years 1899 and 1900 that originated in the various classes of the product were as follows:

Classification.	1899.		1900.		Inc.	Decrease
	Quantity.	Value.	Quantity.	Value.		
	Fine ozs.		Fine ozs.			
Placer bullion	3,592.78	\$4,645.20	3,252.20	\$4,204.86	.....	\$440.74
Mill bullion	2,690,892.07	3,479,133.17	1,766,692.59	2,284,208.60	.....	1,194,924.57
Cyanides	97,684.83	126,299.58	109,452.68	141,514.58	15,215.00	.....
From copper ores..	9,890,572.37	12,787,810.73	9,324,085.39	12,055,383.13	.....	732,427.60
From lead ores ...	2,504,695.24	3,238,393.85	2,134,802.18	2,760,148.27	.....	478,245.58
From smelting ores	1,663,317.56	2,150,551.99	956,550.07	1,236,751.61	.....	913,800.38
Total	16,850,754.85	21,786,834.52	14,294,835.11	18,482,211.05	15,215.00	3,319,838.87

The silver obtained from the placer mines of the State is insignificant, this metal being associated with the gold as a by-product. The gain in silver recovered at the cyanide plants in the State is to be attributed to the same causes attendant upon the gain in gold from this source. Decreases in the sil-

ver production of 1900 below that of 1899 occurred in the mill product, in the ores sent to the smelters, and in that taken as a by-product from copper and from lead ores. The abandonment of the Elkhorn mine, already noted, partially explains the falling off of the silver from milling plants. Besides this the amount taken from the ores of the Philipsburg district was decreased. The output of silver in Dore bullion by the Montana Mining Company, at Marysville, and from other mills in the State also shows a lessened output during 1900. A decrease in the silver won from the smelting of copper and lead ores was due either to a decreased output of the ores themselves or to a smaller amount of the silver contents per ton of ore mined and treated.

The mining of the copper ores of the State is still the most important and valuable feature of the metal-mining industry. The city of Butte, the center of this production, continues to be the scene of great commercial and industrial activity. Its production of that metal is the greatest of any region in the world, more than one-fourth of the world's supply of copper coming therefrom. The previous large number of employees under ground at Butte and in the smelters at Butte, Anaconda, and Great Falls was maintained steadily throughout the year, while the tonnages of the railroads in coal and incoming supplies and in copper matte and ores outgoing was never greater.

The mining of lead ore was of decreasing importance during 1900, the principal centers of production having been in Meagher, Cascade, Flathead, Beaverhead, and Broadwater counties.

Beaverhead County.

The yield of precious metals during 1900 was below that of the preceding year, as shown in the following table:

Metal.	1899.		1900.		Decrease
	Quantity.	Value.	Quantity.	Value.	
Gold, fine ounces	7,822.485	\$161,705.11	6,216.928	\$128,515.31	\$33,189.80
Silver, fine ounces	253,262.01	*327,449.87	233,323.71	*301,671.05	25,778.82
Copper, fine pounds ..	165,719	27,625.36	131,494	21,288.88	6,336.48
Lead, fine pounds ..	1,038,894	46,438.56	1,013,524	44,290.99	2,147.57
Total .....	.....	563,218.90	.....	495,766.23	\$67,452.67

* Coining value.

Re cent years have witnessed but few changes in the mining operations of Beaverhead county, or in the discovery of new ore deposits, or the opening of districts previously unworked. The principal addition was the installation and operation of a dredging device near Grant to handle the gravels along Horse Prairie creek. As in recent years dredging operations were pursued uninterruptedly along Grasshopper creek, near Bannack. The mines and smelting plant of the Hecla Consolidated Mining Company, at Glendale, also continued operations with but little change in the conditions that have obtained at this property in recent years.

Broadwater County.

The quantity and value of the mineral product from this county in 1900

is shown by the table below, and is compared with corresponding figures for the preceding year :

Metal.	1899.		1900.		Decrease
	Quantity.	Value.	Quantity.	Value.	
Gold, fine ounces	8,262.627	\$170,803.66	6,644.593	\$137,355.93	\$33,447.73
Silver, fine ounces	144,948.35	187,407.96	*108,644.53	*140,469.69	36,138.27
Lead, fine pounds	1,088,036	48,635.21	1,024,804	44,783.93	3,851.28
Total .....	.....	406,846.83	.....	\$322,609.55	\$84,237.28

* Coining value.



VIEW OF ANACONDA HILL, BUTTE.

The decrease arose principally in the district around Winston. The output from the Hassel district was also lower than in the former year. General activity characterizes operations in the districts around Winston, Radersburg, Hassel, and Diamond City. The ores of the Winston district are silver-lead, the principal producers during 1900 having been the East Pacific and Custer mines. Much exploration is said to have been done at the East Pacific and elsewhere in the district, with good results, and it is likely that the output from this district will be increased. There was an increase in the amount of metal produced in the district around Radersburg, where the Keating mine is the oldest and most important property. Some gold was washed from the gravels of Confederate Gulch, near Diamond City. Prospecting for quartz was also done. The Diamond Hill mines at Hassel produced but little bullion during the year, and, owing to the low grade of the ore experienced, the company owning and operating the mines have abandoned their work and are offering their entire milling plant for sale.

Cascade County.

The output of the metals in this county during 1900 was less than in the former year, the amounts and values being shown below:

Metal.	1899.		1900.		Decrease
	Quantity.	Value.	Quantity.	Value.	
Gold, fine ounces	2,128.526	\$44,000.54	2,001.155	\$41,367.54	\$2,633.00
Silver, fine ounces	912,723.21	*1180,086.57	781,448.35	*1,010,357.46	169,729.11
Lead, fine pounds	3,810,679	170,337.35	2,164,475	94,587.55	75,749.80
Total .....	.....	1,394,424.46	.....	1,146,312.55	\$248,111.91

* Coining value.

This output of metals was taken from the Neihart and Barker districts, where the ores carry their principal values in silver and lead. Both camps showed activity during the year, and, while the product was less in 1900 than in the former year, the outlook for an improvement is encouraging. In the Neihart district the principal producers were the Broadwater, Diamond R., Florence, Big Snowy, and Galt mines.

The leading producer in the Barker district was the property of Wright & Edwards, while the Grey Eagle, Liberty, Moulton, and Equator mines aggregated a considerable tonnage for the year. Here, too, there was some yield from small producing properties.

Choteau County.

The precious metals produced in this county in 1900 came from the mines of the Landúsky district in the Little Rocky Mountains, the quantities and values being as follows:

Metal.	1900.	
	Quantity.	Value.
Gold	Fine ounces. 1,643.623	\$33,976.70
Silver*	1,811.05	*2,341.55
Total .....	.....	36,318.24

* Coining value.

Deer Lodge County.

An improvement in the output of precious metals from this county is to be noted for 1900. The values of the gold, silver, copper, and lead are shown in the following table in comparison with corresponding figures for 1899:

Metal.	1899.		1900.		Increase	Decrease
	Quantity.	Value.	Quantity.	Value.		
Gold, fine ounces..	10,349.123	\$213,935.36	9,124.836	\$188,627.10	.....	\$25,308.26
Silver, fine ounces.	4,493.37	*5,809.60	120,415.23	*155,688.38	\$149,879.78	.....
Copper, fine lbs ...	50,000	8,335.00	24,374	3,946.15	.....	4,388.85
Lead, fine lbs .....	.....	.....	399,000	17,436.30	17,436.30	.....
Total .....	.....	228,079.96	.....	365,697.93	167,316.08	29,697.11

* Coining value.

The above product consisted of placer gold from the gulches throughout the county, and of arsenical iron and other ores from the mines tributary to Deer Lodge. The principal producer in the county was the Emery mine. This property shipped its product to the smelters for treatment and returns. Some ore was also taken by leasers from the old workings belonging to the Royal Mining Company.

Fergus County.

The gold and silver added to the State's output by the mines of Fergus county in 1900, together with corresponding figures for the preceding year, are shown in the following table:

Metal.	1899.		1900.		Increase
	Quantity.	Value.	Quantity.	Value.	
Gold, fine ounces	8,883.774	\$183,643.91	12,580.665	\$260,065.43	\$76,421.52
Silver, fine ounces	5,380.64	*6,956.78	6,136.15	*7,933.61	976.83
Total .....	.....	190,600.69	.....	267,999.04	77,398.35

* Coining value.

This county contains large bodies of low-grade refractory gold ores that have been impossible to work for many years by the methods then employed. However, with the advance that has been made in the successful adaptation of the cyanide process to an increasing range of ores it has been found possible to treat the Fergus county deposits successfully and profitably. The constantly increasing output of values by the mines belonging to and the growth of operations by the Great Northern Mining and Development Company, at Giltedge, have attracted attention to this county, and outside capital has entered the region, purchased new properties, and is arranging for the erection of new works for the treatment of these ore bodies. It is likely that the year 1901 will witness a production from this county about double what it was in 1900.

Flathead County.

The production of precious metals in 1900 by Flathead county, when compared with that of the preceding year, was as follows:

Metal.	1899.		1900.		Increase	Decrease
	Quantity.	Value.	Quantity.	Value.		
Gold, fine ounces .	802.264	\$16,584.27	1,350.132	\$27,909.70	\$11,325.43	.....
Silver, fine ounces	47,380.14	* 61,259.16	67,181.86	*86,861.39	25,602.23	.....
Lead, fine pounds..	1,066,199	47,659.10	803,585	35,116.66	.....	\$12,542.44
Total ....	.....	125,502.53	.....	149,887.75	36,927.66	12,542.44

* Coining value.

This indicates that the development done in this district during recent years must result in the county maintaining a place among the producing counties of the State. The output as yet is comparatively small, nevertheless

it is likely to increase for some years until a uniform production shall be established and continued. The greater part of the present output comes from the district tributary to Libby, although nearly all sections of the county afford many promising prospects. The mines about Libby carry their principal values in gold, lead, and silver. Gold was also taken from the placers along Libby creek and its tributaries.

Granite County.

A comparative table of the amounts and values of gold and silver won from the ores in this county during the years 1899 and 1900 is as follows:

Metal.	1899.		1900.		Decrease
	Quantity.	Value.	Quantity.	Value.	
Gold, fine ounces	7,958.448	\$164,515.72	7,013.688	\$144,935.80	\$19,529.92
Silver, fine ounces	1,989,213.53	2,571,912.44	1,732,528.95	*2,240,037.43	331,875.01
Total .....	.....	2,736,428.16	.....	2,385,023.23	351,404.93

* Coining value.

While a considerable quantity of the gold is taken from the placers and the small mines of this county, it is to the district around Philipsburg that nearly all the enormous quantity of silver in the above table should be credited. This is the location of the famous Granite Mountain mine, besides other widely known properties, together with mammoth mills and refining plants. These properties carry nearly all values in the silver contents.

Jefferson County.

In the following table the values of the gold and silver for the years 1899 and 1900 are shown:

Metal.	1899.		1900.		Increase	Decrease
	Quantity.	Value.	Quantity.	Value.		
Gold, fine ounces..	7,415.708	\$153,296.29	5,235.327	\$108,223.81	.....	45,072.48
Silver, fine ounces	887,929.36	*1,148,029.83	69,053.25	*89,280.97	.....	1058,748.91
Copper, fine lbs ...	25,687	4,282.02	40,063	6,486.19	\$2,204.17	.....
Lead, fine lbs	1,460,880	62,619.34	.....	.....	.....	62,619.34
Total ....	.....	1,368,227.53	.....	203,990.97	2,204.17	1166,440.73

* Coining value.

The decrease was due almost entirely to the abandonment of work at Elkhorn and to lessened operations elsewhere. Some of the principal producers of the previous year also show diminished outputs. Mining operations are carried on in all parts of the county, but principally in the districts around Elkhorn, Clancy, Whitehall, Boulder, Bernice, and Basin.

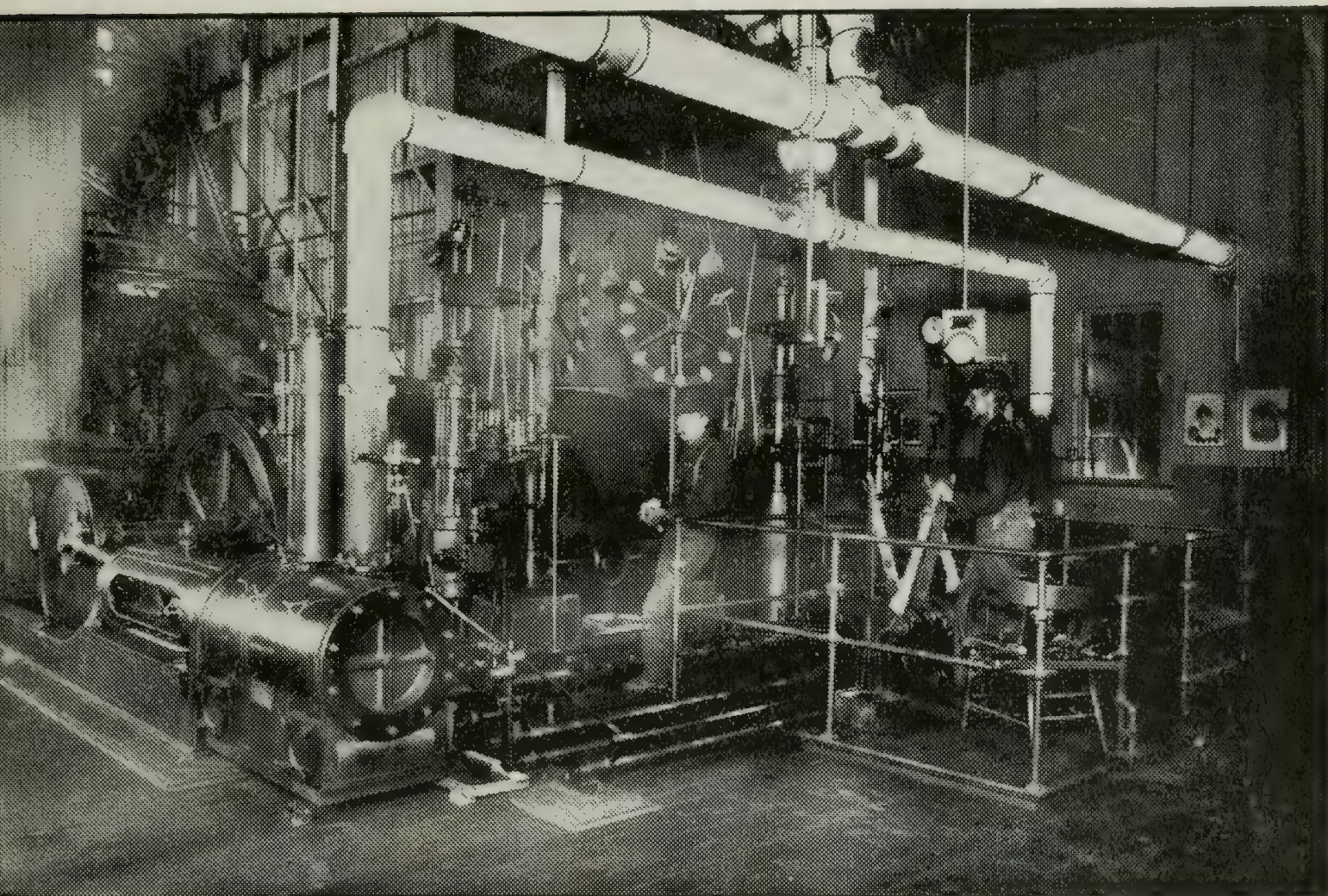
Lewis and Clarke County.

The quantities and values of gold, silver, and lead produced from the mines and placers in this county during 1899 and 1900 were as follows:

Metal.	1899.		1900.		Increase	Decrease
	Quantity.	Value.	Quantity.	Value.		
Gold, fine ounces..	62,535.675	\$1,292,727.13	70,008.241	\$1,447,193.78	\$154,471.65	.....
Silver, fine ounces.	203,251.90	*262,790.33	172,531.70	*223,071.29	.....	\$39,719 04
Lead, fine pounds .	500,000	22,350.00	218,005.00	9,526.82	.....	12,23 18
Total ....	.....	\$1,577,867.46	.....	\$1,679,796.89	\$154,471.65	\$52,542.22

* Coining value.

This county is the largest producer of gold in the State, about one-third of the entire amount recovered being taken from the mines within its bound-



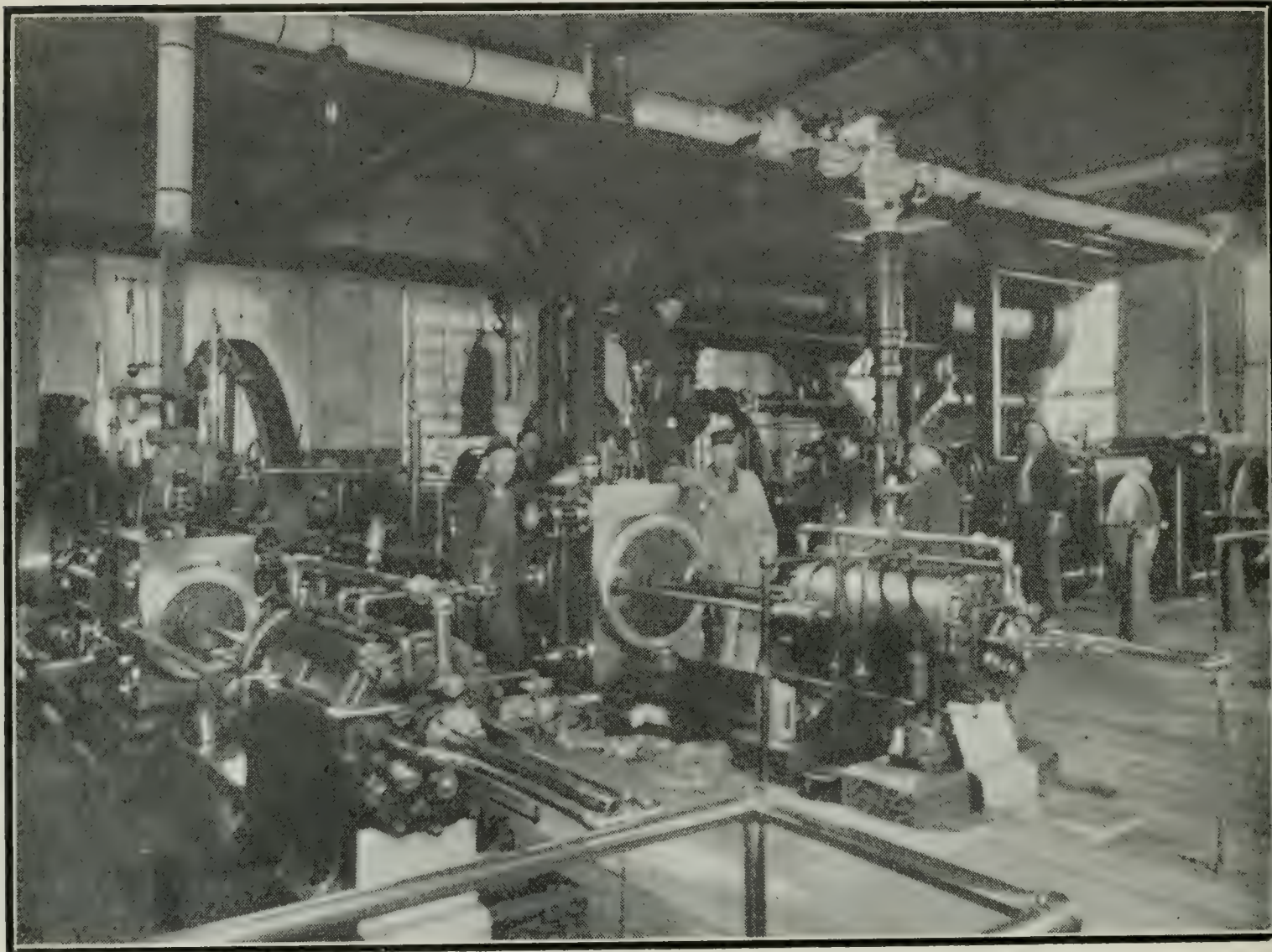
HOISTING ENGINE AT THE EAST STEWART MINE, BUTTE.

aries. The principal districts are around Marysville, Rimini, York, Jay Gould, Stemple, and Lincoln. In 1900 the Marysville district showed great activity and the output therefrom was very large.

From 1883 to 1900 the Montana Mining Company, Limited, has been worked steadily. In 1900 the greater part of the 110 stamps with which this mine is equipped were hung up and remained idle nearly the entire year. The ore deposits in the claims owned by the company are reported to be exhausted, and unless new discoveries are made from explorations now undertaken, it is likely that future milling operations at this property must

cease. This company owns large quantities of tailings, which they are treating by the cyanide process, and it is only a question of time until this source of revenue must fail, unless new ore bodies are discovered or obtained and milling operations resumed.

The long life of this company and its extensive operations has given an impetus to the mining industry in the State, and has been of material advantage to the commercial life and growth of the region in which it is situated.

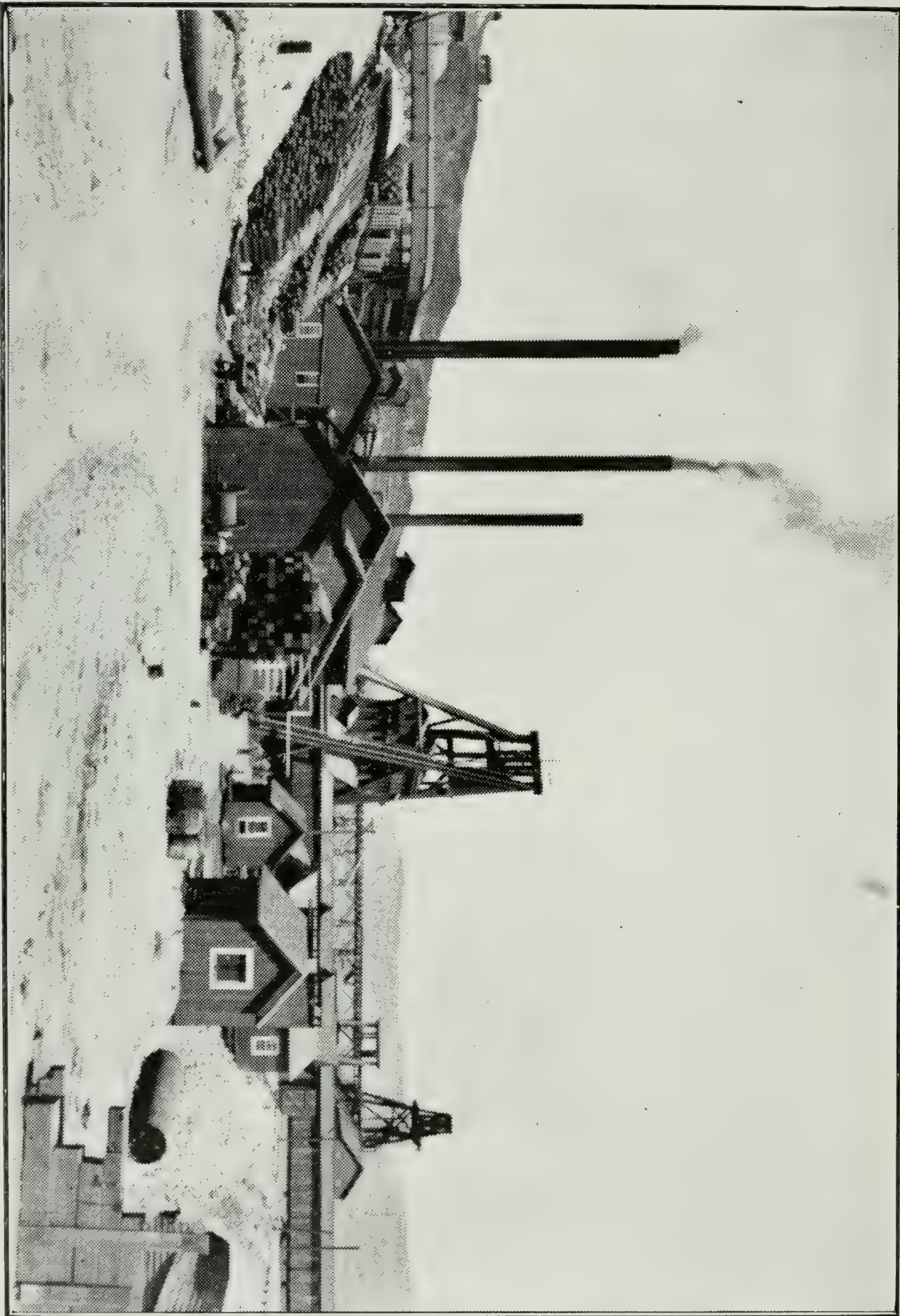


COMPRESSOR POWER ROOM, LEONARD MINE, BUTTE.

The Bald Butte Mining Company, whose mines are situated on the Continental Divide, enjoyed a year of uninterrupted and profitable operation, and at the close of the year the prospect for 1901 was assured.

The 40-stamp mill with which this property is equipped for the reduction of its ores was operated at its usual high point of efficiency during the year.

The Belmont mine, near Marysville, was operated by the Penobscot Mining Company throughout the year. These ores are more refractory than those handled by the other large mills in the district, yet a high percentage saving of the values is effected by immediate cyaniding after the tailings leave the amalgamating tables.



MINNIE HEALY MINE, BUTTE

During 1900 the 40-stamp mill belonging to Thomas Cruse reduced a large tonnage of ores from the Bald Mountain and North Star mines. Other properties around Marysville were discovered and explored, and some ore therefrom was mined and milled during 1900. Notably among such were those at Empire, Gloster, and Big Ox. Prospecting was also active near Granite Butte, Jay Gould, and Stemple, all of which adjoin the Marysville district.

The York district, east of the Missouri river, showed considerable activity in prospecting and placer mining. Some bullion was won from the ores mined there, while the returns from the placers were considerable.

A large quantity of low-grade base ores was shipped from the Rimini district. Values were also recovered from the districts around Unionville, Lincoln, and Butler. The large works at East Helena for the reduction of custom ores and mine products produced in the State continued operations throughout the year. The tonnage of material handled was largely increased over that of former years, and in order to treat this new and extensive additions are being made. The plant at Canyon Ferry, where a dam has been built across the Missouri river, furnished the reduction works at East Helena with electrical power. In order to supply this power to the mines and works at Butte, a line is being built from Canyon Ferry to that city, and the plant itself is being greatly increased in size and capacity.

Madison County.

The output of precious metals in Madison county in 1900 showed some increase over the year 1899, as is set forth by the following comparisons:

Metal.	1899.		1900.		Increase	Decrease
	Quantity.	Value.	Quantity.	Value.		
Gold, fine ounces..	23,708.977	\$490,108.05	26,859.374	\$555,232.54	\$55,124.49	.....
Silver, fine ounces.	104,350.74	*134,918.12	130,634.02	*168,900.55	33,982.43	.....
Copper, fine lbs....	40,000	6,668.00	18,000	2,914.20	.....	\$3,753.80
Lead, fine lbs	370,477	16,560.32	222,000	9,701.40	.....	6,858.92
Total ....	.....	\$648,254.49	.....	\$736,748.69	\$89,106.92	\$10,612.72

*Coining value.

The mining done in this county is confined to the South Boulder and McCarty ranges. The principal centers are at Virginia City, Sheridan, Rochester, Silver Star, Twin Bridges, Parrott, Pony, Red Bluff, Norris and Revenue.

Meagher County.

The figures of the production of gold and silver won from the mines at Castle and elsewhere in the county during 1900 are as follows, a comparison being made with similar data for 1899:

Metal.	1899.		1900.		Increase	Decrease
	Quantity.	Value.	Quantity.	Value.		
Gold, fine ounces...	242.857	\$5,020.33	168.446	\$3,482.09	.....	\$1,538.21
Silver, fine ounces..	150,020.86	*193,963.36	255,610.35	*330,486.11	\$136,519.75	.....
Lead, fine pounds.	5,000,000	253,500.00	4,500,000	196,650.00	.....	26,850.00
Total .....	.....	\$422,486.69	.....	\$530,618.20	\$136,519.75	\$28,381.21

*Coining value.

Missoula County.

The entire product from this county consists of high-grade placer gold taken from various gulches. The output for 1899 and 1900 is shown below :

Metal.	1899.		1900.		Increase
	Quantity.	Value.	Quantity.	Value.	
Gold, fine ounces	2,749.893	\$56845.44	3,229.399	\$66,757.60	\$9,912.16
Silver, fine ounces	100.96	*130.53	151.39	*195.74	65.21
Total .....	.....	\$56,975.97	.....	\$66,953.34	\$9,977.37

*Coining value.

Park County.

The development of the mines belonging to the Bear Gulch Mining Company, at Jardine, is bringing this county into prominence as a producer. A gain was made in 1900 over the yield of the previous year, as shown by the following figures :

Metal.	1899.		1900.		Increase
	Quantity.	Value.	Quantity.	Value.	
Gold, fine ounces	5,883.176	\$121,616.04	9,778.754	\$202,144.78	\$80,528.74
Silver, fine ounces..	453.72	*593.09	1,927.23	*2,491.77	1,898.68
Total .....	.....	122,209.13	.....	\$204,636.55	\$82,427.42

*Coining value.

Besides the mines at Jardine, values were won in 1900 from placers and from the mines at Crevasse, Contact, and Cooke City.

Silver Bow County.

Nearly the entire yield of precious metals in 1900 was contained in the copper ores mined at Butte, the output in 1899 and 1900 having been as follows :

Metal.	1899.		1900.		Decrease.
	Quantity.	Value.	Quantity.	Value.	
Gold, fine ozs..	62,038.377	\$1,292,447.03	54,552.115	\$1,127,692.30	\$154,754.78
Silver*, fine ozs	9,855,831.97	*12,742,193.68	9,454,279.36	*12,223,714.73	519,179.15
Copper, fine lbs	245,245.908	40,852,492.6	245,783,551	39,792,356.90	1,090,135.93
Total .....	.....	51,907,833.82	.....	\$53,143,763.93	\$1,764,069.89

*Coining value.

The above values show the enormous amount of production by the Butte mines. Besides the values won from copper ores, some returns are secured from placers of the county and from silver ores.

The following statistical tables of Montana production, showing the quantity and values of the precious metals, their origin by counties, and from the several classes of ores, together with the final disposition of the ores and bullion as to sale and treatment, have been assembled from confidential returns furnished by the producers.

These totals have been verified by comparison with those made from figures and data given by the United States mints and assay offices and the smelters and refineries that handled the Montana product.

DEPOSITS AT THE UNITED STATES ASSAY OFFICE, HELENA, DURING
THE CALENDAR YEAR 1900.

SOURCE OF DEPOSIT	GOLD		SILVER		Total Value
	Standard Ounces	Value	Standard Ounces	Value	
Montana:					
Beaverhead County	445.590	\$8,290.04	48.49	\$26.97	\$8,317.01
Broadwater County	3,074.922	57,207.82	308.61	167.69	57,375.51
Cascade County	5.067	94.27	.25	.14	94.41
Custer County	14.449	268.82	3.93	2.22	271.04
Deer Lodge County	4,704.836	97,531.76	665.23	363.71	97,895.47
Flathead County	1,119.113	20,820.70	157.63	85.51	20,906.21
Granite County	1,316.698	24,496.70	201.98	108.99	24,605.69
Jefferson County	2,036.021	37,879.41	160.85	88.10	37,967.51
Lewis and Clarke County.....	32,770.600	609,685.47	14,090.18	7,654.44	617,339.91
Madison County	11,846.047	220,391.51	2,557.98	1,414.41	221,805.92
Meagher County	163.446	3,133.86	10.35	5.76	3,139.62
Missoula County	3,229.399	60,081.82	151.39	84.00	60,165.82
Park County	8,384.754	155,995.34	1,597.23	873.54	156,868.88
Ravalli County	823.738	15,418.36	54.76	30.24	15,448.60
Silver Bow County	2,993.295	55,784.06	872.17	478.03	56,262.09
Total Montana	72,943.076	1,357,079.94	20,881.03	11,383.75	1,368,463.69
Alaska	259.654	4,830.76	49.26	27.80	4,858.56
Georgia	145.053	2,698.65	7.69	4.34	2,702.99
Idaho	11,069.125	205,937.12	2,181.76	1,194.00	207,131.12
Oregon	1,086.704	20,217.75	256.26	142.00	20,359.75
Washington	155.775	2,916.73	51.50	29.10	2,945.83
Northwest Territory	709.673	13,203.21	176.71	97.50	13,300.71
British Columbia	25,883.978	481,562.32	12,353.84	6,761.49	488,323.81
Jewelry	28.033	521.54	7.66	4.10	525.64
Re-deposits	45.310	842.98	5.52	2.93	845.91
Total	39,384.305	732,731.06	15,090.20	8,263.26	740,994.32
Grand Total	112,327.381	2,089,811.00	35,971.23	19,647.01	2,109,458.91

EIGHTH BIENNIAL REPORT OF BUREAU

PRODUCTION OF GOLD AND SILVER IN MONTANA DURING THE CALENDAR YEAR 1900.

SUMMARY BY COUNTIES	GOLD		SILVER		Total Value
	Fine Ounces	Value	Fine Ounces	Coining Value	
Beaverhead	6,216.928	\$128,515.31	233,323.71	\$301,671.05	\$430,186.36
Broadwater	6,644.593	137,355.93	108,644.53	140,469.69	277,825.62
Cascade	2,001.155	41,367.54	781,448.35	1,010,357.46	1,051,725.00
Choteau	1,643.623	33,976.70	1,811.05	2,341.55	36,318.25
Custer	14.449	298.69	3.93	5.08	303.77
Deer Lodge	9,124.836	188,627.10	120,415.23	155,688.38	344,315.48
Fergus	12,580.665	260,065.43	6,136.15	7,933.61	267,999.04
Flathead	1,350.132	27,909.70	67,181.86	86,861.39	114,771.09
Granite	7,013.688	144,895.80	1,732,528.95	2,240,037.43	2,385,023.23
Jefferson	5,235.327	108,223.81	69,053.25	89,280.97	197,504.78
Lewis and Clarke	70,008.241	1,447,198.78	172,531.70	223,071.29	1,670,270.07
Madison	26,859.374	550,232.54	130,634.02	168,900.55	724,133.09
Meagher	168.446	3,482.09	255,610.35	330,486.11	333,968.20
Missoula	3,229.399	66,757.60	151.39	195.74	66,953.34
Park	9,778.754	202,144.78	1,927.23	2,491.77	204,636.55
Ravalli	828.733	17,131.53	54.76	70.80	17,202.33
Silver Bow	54,552.115	1,127,692.30	9,454,279.36	12,223,714.73	13,351,407.03
Returns from custom smelters, mints, and assay offices impossible to classify by counties	11,864.419	245,259.32	1,159,099.29	1,493,633.45	1,743,892.77
Total	229,114.882	4,736,224.95	14,294,835.11	18,482,211.05	23,218,436.00

BULLION OF MONTANA PRODUCTION DEPOSITED AT THE UNITED STATES ASSAY OFFICE, HELENA, MONT., DURING THE CALENDAR YEAR 1900.

ORIGIN	GOLD		SILVER		Total Value
	Standard Ounces	Value	Standard Ounces	Commercial Value	
Placer gold	20,092.284	\$373,809.61	2,797.20	\$1,540.07	\$375,349.63
Mill bullion	52,850.792	983,270.33	18,083.83	9,843.68	993,114.01
Total	72,943.076	1,357,079.94	20,881.03	11,383.75	1,368,463.69

BULLION OF MONTANA PRODUCTION DEPOSITED AT THE UNITED STATES MINTS AND ASSAY OFFICES DURING THE CALENDAR YEAR 1900.

INSTITUTION	GOLD		SILVER		Total Value
	Standard Ounces	Value	Standard Ounces	Coining Value	
Mints:—					
Denver	112.136	\$2,086.25	11.93	\$13.88	\$2,100.13
Philadelphia	2,704.178	50,310.29	2,941.68	3,423.04	53,733.33
San Francisco	82.150	1,528.37	10.25	11.93	1,540.30
Assay Offices:—					
Boise	6,725.295	125,121.77	539.14	627.36	125,749.13
Helena	72,943.076	1,354,080.48	20,881.03	24,297.93	1,381,378.41
New York	27,799.832	517,206.18	32,782.97	38,147.46	555,353.64
Seattle	4.715	87.72	2.17	2.52	90.24
Total	110,371.382	2,053,421.06	57,169.17	66,524.12	2,119,945.18

PRODUCTION OF GOLD AND SILVER IN MONTANA (ORIGIN DETAILED)
DURING THE CALENDAR YEAR 1900.

ORIGIN	GOLD		SILVER		Total Value
	Fine Ounces	Value	Fine Ounces	Coining Value	
Placer bullion	26,709.214	\$552,128.45	3,252.20	\$4,204.86	\$556,333.31
Mill bullion	70,350.342	1,454,270.64	1,766,692.59	2,284,208.60	3,738,479.24
Cyanide mill bullion	42,923.697	837,311.57	109,452.68	141,514.58	1,028,826.15
In copper ores	54,252.098	1,121,490.40	9,324,085.39	12,055,383.13	13,176,873.53
In lead ores	7,918.654	163,693.10	2,134,802.18	2,760,148.27	2,923,841.37
In dry ores and concentrates, classed as smelting ores.....	26,960.877	557,330.79	956,550.07	1,236,751.61	1,794,082.40
Total	229,114.882	4,736,224.95	14,294,835.11	18,482,211.05	23,218,436.00

ORIGIN, BY PERCENTAGES, OF THE PRODUCTION OF GOLD AND SILVER
IN MONTANA DURING THE CALENDAR YEAR 1900.

Origin.	Gold.	Silver
	Percentage	Percentage
Placer bullion	11.66	0.02
Mill bullion	30.71	12.41
Cyanide mill bullion	18.73	.71
Copper ores	23.68	65.23
Lead ores	3.45	14.94
Dry ores	11.77	6.69
Total	100	100

PRODUCTION OF COPPER AND LEAD IN MONTANA DURING THE CALENDAR YEAR 1900.

Summary by Counties.	Copper	Lead.
	Fine pounds	Fine pounds
Beaverhead	131,494	1,013,524
Broadwater		1,024,804
Cascade	883	2,164,475
Deer Lodge	24,374	399,000
Fergus		8,392
Flathead		863,585
Jefferson	40,063	
Lewis and Clarke		218,005
Madison	18,000	222,000
Meagher		4,500,000
Silver Bow	245,783,551	211,971
Custom smelters in addition to the above not possible to distribute by counties		5,478,995
Total production	245,998,365	16,014,751

DISPOSITION OF GOLD AND SILVER OF MONTANA PRODUCTION DURING THE CALENDAR YEAR 1900.

DISPOSITION	GOLD		SILVER		Total Value
	Fine Ounces	Value	Fine Ounces	Coining Value	
Deposited at the United States mints and assay offices.....	99,334.244	2,053,421.06	51,452.26	\$66,524.12	\$2,119,945.18
Shipped to custom smelters and refineries by producers..	129,780.638	2,682,803.89	14,243,382.85	18,415,686.93	21,098,490.82
Total	229,114.882	4,736,224.95	14,294,835.11	18,482,211.05	23,218,436.00

TOTAL PRODUCTION OF PRECIOUS METALS IN MONTANA DURING THE CALENDAR YEAR 1900.

Description.	Quantity.	Value.
Gold, fine ounces.....	229,114.882	\$4,736,224.95
Silver (coining value), fine ounces	14,294,835.11	18,482,211.05
Copper, at \$16.19 per hundred weight, fine pounds	245,998,365	39,827,135.29
Lead, at \$4.37 per hundredweight, fine pounds	16,044,751	701,155.62
Total		\$63,746,726.91

PRODUCTION FOR THE YEAR 1901.

Of the mineral production for the year 1901, Mr. Tatem says:

The value of the precious metals produced in Montana during 1901 was \$60,387,619.01. This aggregate consists of the gold, silver, copper and lead won from metal mining and was distributed as shown in the table which follows:

Description.	Quantity.	Value.
Gold, fine ounces	232,331.454	\$4,802,717.39
Silver, fine ounces, (coining rate)	14,180,545.19	18,334,442.26
Copper, fine pounds, at \$16.117 per hundred weight	228,031,503	36,751,837.34
Lead, fine pounds, at \$4.334 per hundred weight	11,504,892	498,622.01
Total		\$60,387,619.01

When compared with the production of the preceding year a decrease of about three million dollars is to be noted in the comparison which follows, nearly all of which, however, was due to a lessened production of copper and a lower price for this metal:

METALS	1900		1901		Increase or Decrease
	Quantity	Value	Quantity	Value	
Gold, fine ozs....	229,114.882	\$4,736,224.95	232,331.454	\$4,802,717.39	**\$66,492.44
Silver, fine ozs ..	*14,294,835.11	18,482,211.05	14,180,545.19	18,334,442.26	***147,768.79
Copper, fine lbs..	245,998,365	39,827,135.29	228,031,503	36,751,837.34	***3,075,297.95
Lead, fine lbs	16,044,751	701,155.62	11,504,892	498,622.02	*** 202,533.60
Total		\$63,746,726.91		\$60,387,619.01	***\$3,359,107.90

* Coining Value. ** Increase. *** Decrease.

Little change in the value of the gold produced in 1901 is shown, yet the enlarged use of cyanide to win this precious metal from Montana ore during 1901 merits notice. The principal scene of new activity was Fergus county. If the future operations result as now believed, this field will materially aid in maintaining the output of gold in the State, if indeed it does not result in increasing the same in the future. Had it not been for what already is accomplished in that section, the total yield of gold in the past year would have decreased; the increased values from milling and cyanide ores fortunately overbalancing the decrease from the smelting ores and placers.

The gold won in the years 1900 and 1901 originated from the sources shown below, the increase or decrease also being indicated:

CLASSIFICATION	1900		1901		Increase or Decrease
	Fine Oz.	Value	Fine Oz.	Value	
Placer bullion	26,709.214	\$552,128.45	25,285.602	\$522,699.78	**\$29,428.67
Mill bullion	70,350.342	1,454,270.64	72,961.647	1,508,251.10	*53,980.46
Cyanides	42,923.697	887,311.57	57,013.558	1,178,574.84	*231,263.27
From copper ores	54,252.098	1,121,490.40	45,850.574	947,815.49	**173,674.92
From lead ores	7,918.654	163,693.10	6,479.641	133,946.07	**29,747.03
In smelting ores	26,960.877	557,330.79	24,740.432	511,430.12	**45,900.67
Total	229,114.882	\$4,736,224.95	232,331.454	\$4,802,717.39	*\$66,492.44

* Increase.

** Decrease.

A perusal of the above table shows but little change in the amounts of gold won from the several classes of mining, the difference in each case being small and indicates practically no change from that of the previous year.

What has been said of gold can likewise be said of silver, viz: That but little change occurred during the year in the amount of this metal won from any of the different branches of mining except that derived from lead ores. This large increase is principally due to the closing of the American Smelting & Refining Company's plant near Great Falls, Montana, compelling the mining of lead ores in that section to cease temporarily.

The changes that occurred in the output of silver during the years 1900 and 1901 may be seen in the table which follows:

CLASSIFICATION	1900		1901		Increase or Decrease
	Fine Oz.	Value	Fine Oz.	Value	
Placer bullion	3,252.20	4,204.86	2,730.78	\$3,530.70	**\$674.16
Mill bullion	1,766,692.59	2,284,208.60	2,042,990.48	2,641,442.24	*357,233.64
Cyanides	109,452.68	141,514.58	126,492.27	163,545.56	*22,030.98
From copper ores	9,321,085.39	12,055,383.13	10,136,892.57	13,106,285.34	*1,050,902.21
From lead ores	2,134,802.18	2,760,148.27	397,029.03	513,330.47	**2,246,817.80
From smelting ores	956,550.07	1,238,751.61	1,474,410.06	1,906,307.95	*669,556.34
Total	14,294,835.11	\$18,482,211.05	14,180,545.19	\$18,334,442.26	**147,768.9

Coining value.

* Increase.

** Decrease.

Although the total amount of silver produced for some years in this State is enormous, it has nearly all been a by-product incident to other mining. The mining of ores, carrying their values exclusively in silver, was done in the

Philipsburg and Elkhorn districts, where large and valuable deposits of silver ore have long been worked successfully.

Lead mining in Montana is of small importance, the aggregate production being but a trifle proportionately. Copper mining was continued on the usual



STEEL GALLOWS FRAME AT ANACONDA MINE.

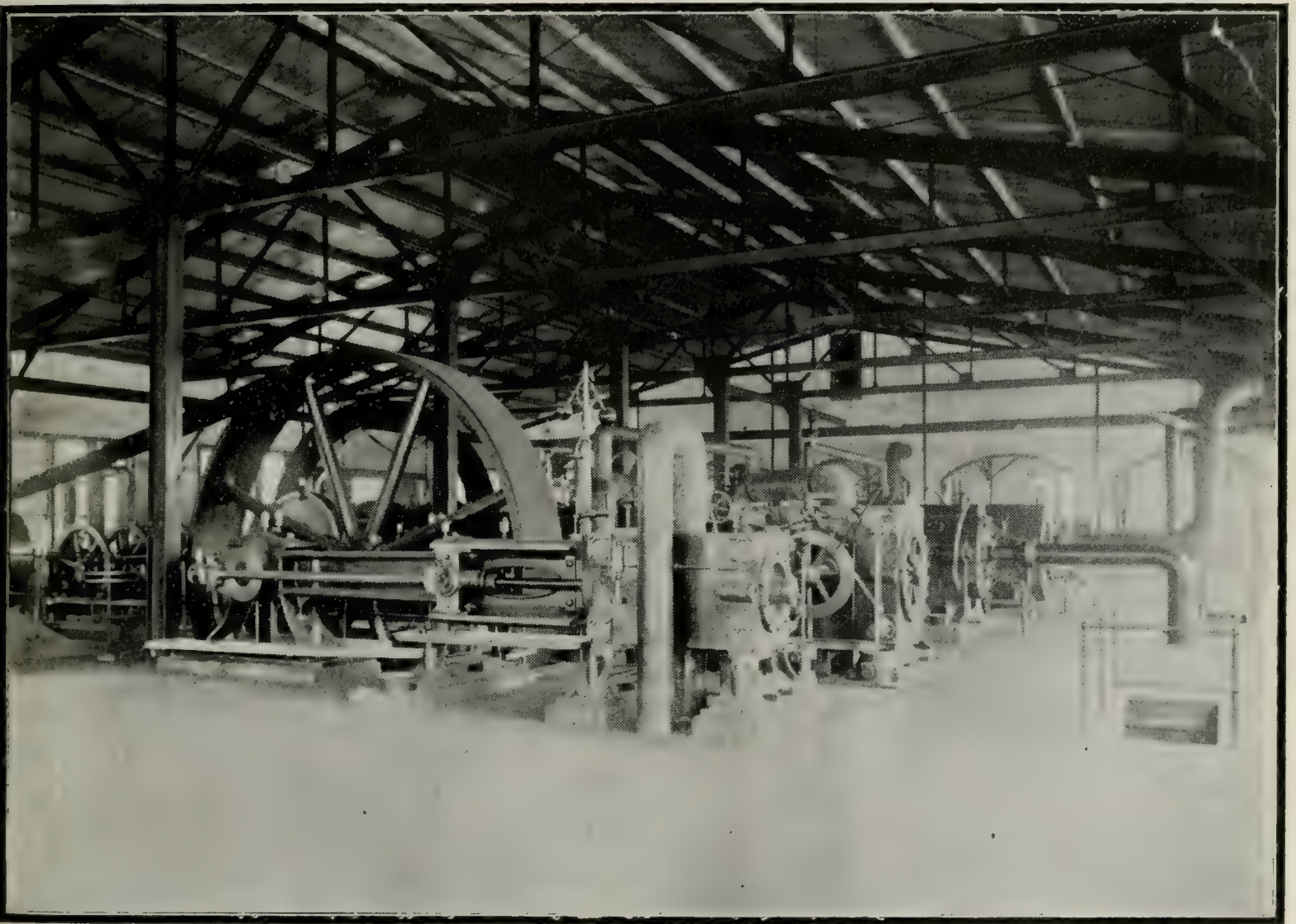
large scale of recent years in the Butte district, little or no noteworthy features having occurred therein.

Beaverhead County.

Occupying the southwestern part of the State, this county has been a producer of considerable prominence since 1862. Gold in considerable quantities was first mined in the State at Bannack. Mining operations in 1901 were devoid of unusual features. For some years dredging machines have

been working the channel of Grasshopper creek and winning much gold that was left there in the early days when machinery was not available. These dredges worked throughout the season of 1901, their gold output being practically that of recent years.

The large operations of the Hecla Consolidated Mining Company that formerly characterized the district around Glendale have for some years been growing of less importance, owing to the obstacles in the discovery and development of the ore bodies. In 1901 these conditions were unchanged. Con-



COMPRESSOR ROOM AT NEVER SWEAT MINE, BUTTE.

siderable prospecting is being done in the mining sections of the county, the results being encouraging and may lead to the development of producing properties in the future.

Broadwater County.

The mining of precious metals in 1901 was distributed to the several districts of the county, but most extensively so throughout the district south of Winston. Here the East Pacific and other properties have long been regular shippers. Gold and silver also came from the Hassel, Park, and Radersburg districts. The placers at Diamond City and in the vicinity of Townsend were worked in 1901.

Cascade County.

The ores mined here were principally from the Neihart and Barker districts, being of the class known as silver-lead products. Owing to many of these being low grade in values it was impossible to work all the former producing properties throughout the county in 1901 on account of the custom smelter at Great Falls having been closed. Because of this the heavy falling off in the aggregate values is accounted for.



1200-FOOT STATION, LEONARD MINE, BUTTE.

The large works belonging to the Boston & Montana Consolidated Copper & Silver Mining Company near Great Falls were in operation throughout the year on the large tonnage of ores received from the mines belonging to the company in the Butte district.

Fergus County.

This county witnessed the most important advancement made in Montana during 1901 for the winning of gold. The application of the cyanide process to handle the low-grade deposits of gold ore in the Gilt Edge district attracted much capital, and the year was marked by the erection of new plants, extensive development and a large output of gold commenced there-

from. This product amounted to a very considerable figure, the output of nearly 34,000 standard ounces of gold having nearly all been the result of the employment and adoption of the cyanide process to extract the values.

The leading mines employing the cyanide process in the Gilt Edge district during the year were the Gilt Edge, Kendall, Barnes-King group and Whiskey gulch. At all of these marked activity was to be noted, while other claims were brought out preparatory to opening for production.

Flathead County.

The mining operations in Flathead county that had been carried on in 1901 were continued throughout the year. Some of the prospects in the Libby district gained an importance that promises to make them producing mines in the near future. The principal mine was the Snow Shoe, where the work that had been suspended for some time was taken up by a new management that effected the uncovering of large bodies of high-grade ore.

Granite County.

While this county ranks high as a producer of gold from its mines and mills, yet it is from the high-grade silver deposits at Philipsburg that the principal importance attaches. Here the Granite-Bimetallic Mining Company worked its large mills throughout the year on ores carrying their values almost exclusively in silver. The placers of the county yielded a very handsome return in gold for the work prosecuted during the year.

Jefferson County.

Considerable activity was displayed at the Elkhorn mine because of the erection and equipment of reduction works to treat the low-grade ores remaining both in the old workings of the mine and in the large dumps outside. The other districts of the county show but little or no change from conditions of the previous year.

Lewis and Clarke County.

This county, which has long been the greatest producer of gold in Montana, maintained its prestige throughout 1901. The operations of the large producers in the county were on about the same scale as in 1900. What is known as the Marysville district is entirely in this county and contains the Bald Butte and Drumlummon mines. The Belmont and Cruse properties in this district were idle most of the year. New cyanide plant works were erected at the Empire and Granite Butte mines to treat the accumulated tailings, while in the Empire mine itself a large sum of money was expended by Michigan capitalists to explore the ore zone tributary to its old works. A cyanide plant in Piegan gulch worked over the tailings from the Gloster mill, until the approach of freezing weather. A cyanide plant was also working on the tailings below the Jay Gould mine. The other districts of the county also saw the work of former years continued during 1901 and the winning of an average production from each in consequence.

Madison County.

From the operations in this county large gold and silver values were gained, thus giving it an importance in the amount of gold that was produced excelled by only two of the counties in the State.

At Pony work was prosecuted rapidly upon the Boss Tweed-Clipper group recently purchased by Butte and other Eastern capitalists, who secured the 120-stamp mill that some two or three years ago had been erected at the Diamond Hill mine in Broadwater county. This was removed and set up at Pony. The other places from which gold was won were Alder gulch, Red Bluff and the Richmond Flat district.

Park County.

In the Bear Gulch district considerable activity was manifested during the year, the Bear Gulch company having worked its twenty-stamp mill steadily throughout the year. Some gold also came from the placer district near Chico.

Powell County.

The gold and silver produced in this county was from mines of the Garnet district and from the many placers located in the county. This county was created by the Montana Legislature during the session early in the year and comprises nearly all of what was formerly the mining regions of Deer Lodge county. In these little or no changes occurred in 1901.

Silver Bow County.

Mining in this county is confined to the district at Butte and is the most important in the State. The large quantities of gold and silver originating from this county occurred as by-products from the reduction and treatment of the enormous tonnages of ores taken from the mines at this place. The companies mining extensively at Butte in 1901 were the Anaconda, Boston & Montana, Parrot, Colorado, Montana Ore Purchasing Company and the Butte Reduction Works. The product of these mines was treated by the smelters at Anaconda, Great Falls and Butte, Montana.

In the tables which follow the production is shown in its several phases, and is set forth in figures showing practically all details in relation thereto. They have been accurately compiled after wide correspondence and careful investigation, and are therefore valuable to those concerned:

DEPOSITS AT THE UNITED STATES ASSAY OFFICE, HELENA, MONTANA,
DURING THE CALENDAR YEAR 1901.

SOURCE OF DEPOSIT	GOLD		SILVER		Total Value
	Standard Ounces	Value	Standard Ounces	Commercial Value	
Beaverhead	453.603	\$8,439.11	44.91	\$24.45	\$8,463.56
Broadwater	1,159.253	21,567.44	160.29	86.32	21,653.76
Cascade	247.620	4,606.88	100.36	53.72	4,660.60
Custer	4.809	89.47	.38	.21	89.68
Choteau	83.179	1,547.51	40.67	21.10	1,568.61
Fergus	10,080.893	187,551.46	220.19	114.67	187,666.13
Flathead	1,385.875	25,783.72	206.77	109.64	25,893.36
Granite	494.529	9,200.50	45.35	26.04	9,226.54
Jefferson	1,803.978	33,562.37	180.75	97.37	33,659.74
Lewis and Clarke	28,329.809	527,066.00	11,788.23	6,402.11	533,468.11
Madison	15,366.018	285,879.20	4,757.65	2,561.56	288,440.76
Meagher	99.870	1,858.04	5.89	3.19	1,861.23
Missoula	3,166.432	58,910.31	161.42	87.05	58,997.36
Park	9,090.013	169,116.44	2,112.39	1,139.98	170,256.42
Powell	5,275.318	98,145.42	716.38	383.12	98,528.54
Ravalli	1,445.028	26,884.22	100.28	53.14	26,937.36
Silver Bow	2,328.546	43,321.76	580.32	311.63	43,633.39
Total	80,814.773	1,503,529.85	21,225.23	\$11,475.30	\$1,515,005.15
Alaska	491.338	\$9,141.16	56.63	\$29.96	\$9,171.12
Georgia	23.463	436.52	1.44	.79	437.31
Idaho	7,429.378	138,220.90	1,746.54	941.63	139,162.53
Oregon	105.734	1,967.14	29.37	16.55	1,983.69
Washington	1,652.845	30,750.57	485.24	256.64	31,007.21
Wyoming	15.046	279.92	1.38	.75	280.67
British Columbia	25,110.151	467,165.55	15,087.23	8,202.46	475,368.01
Northwest Territory	378.726	7,046.06	114.34	63.39	7,109.45
Jewelry	109.594	2,038.96	26.27	14.36	2,053.32
Re-deposits	468.129	8,709.38	328.35	174.17	8,883.55
Total	35,784.404	\$665,756.16	17,876.79	\$9,700.70	\$675,456.86
Grand Total	116,599.177	2,169,286.01	39,102.02	\$21,176.00	\$2,190,462.01

PRODUCTION OF GOLD AND SILVER IN MONTANA DURING THE CALENDAR YEAR 1901.

SUMMARY BY COUNTIES	GOLD		SILVER		Total Value
	Fine Ounces	Value	Fine Ounces	Coining Value	
Beaverhead ..	6,064.884	\$125,372.28	240,823.86	\$311,368.22	\$436,740.50
Broadwater ..	5,238.107	108,281.28	175,462.66	226,860.81	335,142.09
Cascade ..	1,422.857	29,413.06	250,294.41	323,612.97	353,026.03
Choteau ..	74.862	1,547.54	36.60	47.32	1,594.86
Custer ..	4.328	89.47	.34	.44	89.91
Fergus ..	33,618.681	694,959.81	8,746.10	11,308.09	706,267.90
Flathead ..	2,247.287	46,455.55	40,186.09	51,957.79	98,314.34
Granite ..	10,566.047	218,419.58	1,827,868.32	2,363,304.49	2,581,724.07
Jefferson ..	4,472.870	92,462.43	169,687.01	219,393.30	311,855.73
Lewis and Clarke	51,090.691	1,056,138.32	133,149.24	172,152.55	1,228,290.87
Madison ..	41,079.113	849,180.63	183,772.94	237,605.42	1,086,786.05
Meagher ..	89.883	1,858.05	240,005.30	310,309.88	312,167.93
Missoula ..	3,349.788	69,246.26	845.28	1,092.89	70,339.15
Park ..	9,433.012	194,997.66	2,994.16	3,871.24	198,868.90
Powell ..	7,837.787	162,021.43	81,694.74	105,625.53	267,646.96
Ravalli ..	1,300.526	26,884.25	98.66	116.70	27,000.95
Silver Bow ..	47,132.745	974,320.31	9,638,071.42	12,461,344.86	13,435,665.17
Returns from custom smelters, mints and assay offices, impossible to classify by counties..	7,307.986	151,069.48	1,186,816.46	1,534,469.76	1,685,539.24
Totals	262,331.454	\$4,802,717.39	14,180,545.19	\$18,334,442.26	\$23,137,159.65

EIGHTH BIENNIAL REPORT OF BUREAU

BULLION OF MONTANA PRODUCTION DEPOSITED AT THE UNITED STATES ASSAY OFFICE, HELENA, MONT., DURING THE CALENDAR YEAR 1901.

ORIGIN	GOLD		SILVER		Total Value
	Standard Ounces	Value	Standard Ounces	Commercial Value	
Placer gold	18,187.557	\$333,372.69	2,431.97	\$1,307.99	\$339,680.68
Mill bullion	62,627.216	1,165,157.16	18,793.26	10,167.31	1,175,324.47
Totals	80,814.773	\$1,503,529.85	21,225.23	\$11,475.30	\$1,515,005.15

BULLION OF MONTANA PRODUCTION DEPOSITED AT THE UNITED STATES MINTS AND ASSAY OFFICES DURING THE CALENDAR YEAR 1901.

INSTITUTION	GOLD		SILVER		Total Value
	Standard Ounces	Value	Standard Ounces	Coining Value	
Mints—					
Denver	41.783	\$777.36	6.21	\$7.23	\$784.59
Philadelphia	7,150.058	133,024.33	3,547.93	4,128.50	137,152.83
San Francisco	57.314	1,066.31	3.14	3.65	1,069.95
Assay Offices—					
Boise	7,615.041	141,675.18	780.75	908.51	142,583.69
Helena	80,814.773	1,503,529.85	21,225.23	24,698.45	1,528,228.30
New York	28,587.295	531,856.65	27,579.44	32,092.43	563,949.08
Seattle	5.818	108.24	.89	1.04	109.28
Totals	124,272.082	\$2,312,037.92	53,143.59	\$61,839.81	\$2,373,877.73

PRODUCTION OF GOLD AND SILVER IN MONTANA (ORIGIN DETAILED) DURING THE CALENDAR YEAR 1901.

ORIGIN	GOLD		SILVER		Total Value
	Fine Ounces	Value	Fine Ounces	Coining Value	
Placer bullion	25,285.602	\$522,699.78	2,730.78	\$3,530.70	\$526,230.48
Mill bullion	72,961.647	1,508,251.10	2,042,990.48	2,641,442.24	4,149,693.34
Cyanide mill bullion	57,013.558	1,178,574.84	126,492.27	163,545.56	1,342,120.40
In copper ores	45,850.574	947,815.48	10,136,892.57	13,106,285.34	14,054,100.82
In lead ores	6,479.641	133,946.07	397,029.03	513,330.47	647,276.54
In dry ores and concentrates classed as smelting ores	24,740.432	511,430.12	1,474,410.06	1,906,307.95	2,417,738.07
Totals	232,331.454	\$4,802,717.39	14,180,545.19	\$18,334,442.26	\$23,137,159.65

ORIGIN BY PERCENTAGES OF THE PRODUCTION OF GOLD AND SILVER
IN MONTANA DURING THE CALENDAR YEAR 1901.

ORIGIN	Percentage Gold	Percentage Silver
Placer bullion	10.88	00.03
Mill bullion	31.44	14.41
Cyanide mill bullion	24.54	00.89
Copper ores	19.72	71.49
Lead ores	02.78	02.79
Dry ores	10.64	10.39
Totals	100.00	100.00

PRODUCTION OF COPPER AND LEAD IN MONTANA DURING THE CALEN-
DAR YEAR 1901.

SUMMARY BY COUNTIES	Copper— Fine Pounds	Lead— Fine Pounds
Beaverhead	103,691	767,259
Broadwater		2,407,036
Cascade		852,238
Flathead		300,000
Granite	7,198	6,464
Jefferson	128,196	66,404
Lewis and Clarke ..	13,900	77,483
Madison	3,000	
Meagher		2,500,000
Silver Bow	227,742,262	138,846
Custom smelters in addition to the above not possible to dis- tribute by counties	33,256	4,389,107
Totals	228,031,503	11,504,892

DISPOSITION OF GOLD AND SILVER OF MONTANA PRODUCTION DURING
THE CALENDAR YEAR 1901.

DISPOSITION	GOLD		SILVER	
	Fine Ounces	Value	Fine Ounces	Coining Value
Deposited at the United States mints and assay offices	111,844.874	\$2,312,037.92	47,829.24	\$61,839.81
Shipped to custom smelters and refineries by producers	120,486.580	2,490,679.47	14,132,715.95	18,272,602.45
Totals	232,331.454	\$4,802,717.39	14,180,545.19	\$18,334,442.26

TOTAL PRODUCTION OF PRECIOUS METALS IN MONTANA DURING THE
CALENDAR YEAR 1901.

Description.	Quantity.	Value.
Gold, fine ounces	232,331.454	\$4,802,717.39
Silver, fine ounces (coining rate)	14,180,545.19	18,334,442.26
Copper fine pounds, at \$16.117 per cwt.....	228,031.503	36,751,837.34
Lead, fine pounds, at \$4.334 per cwt	11,504,892	498,622.02
Totals		\$60,387,619.01

Since the discovery of gold in the State not yet forty years ago, more than one billion dollars in value of these metals have been taken from the streams and mountains of the State. No careful compilations were made prior to

1882, but the figures of this output, as given in the following table for that period, are as reliable as can be obtained and have long been accepted as correct. Those shown for the subsequent years are from the statistics as compiled by the bureau of the mint:

PRODUCTION OF GOLD, SILVER, COPPER AND LEAD IN THE STATE OF MONTANA FROM THE YEAR 1862 TO 1901 INCLUSIVE.

YEAR	Gold	**Silver	Copper	Lead	Totals	P. C. Yearly Inc.
1862 to 1881*** (inc.)	\$200,000,000	\$11,000,000	.....	.....	\$211,000,000	.....
1882	2,550,000	4,370,000	\$1,539,860	.....	8,459,860	.....
1883	1,800,000	6,000,000	3,452,960	226,424	11,479,384	37½
1884	2,170,000	7,000,000	5,386,500	246,326	14,802,826	31
1885	3,400,000	11,500,000	6,779,800	274,350	21,954,150	50
1886	4,422,000	13,849,000	5,761,200	494,132	24,526,332	12
1887	5,978,536	17,817,548	8,853,750	607,662	33,257,496	35½
1888	4,200,253	15,790,736	15,103,946	569,160	35,664,095	7½
1889	3,500,000	19,393,939	13,334,970	456,975	36,685,884	3
1890	3,300,000	20,363,636	16,656,437	675,392	40,995,465	11½
1891	2,890,000	20,139,394	14,377,336	1,229,027	38,635,757	5½
1892	2,891,386	22,432,323	19,105,464	990,035	45,419,208	18
1893	3,576,000	21,858,780	16,630,958	964,089	43,029,827	*5
1894	3,651,410	16,575,458	17,233,718	730,551	38,191,137	*11
1895	4,327,040	22,886,992	21,114,869	754,360	49,083,261	28½
1896	4,380,671	20,324,877	25,356,541	670,010	50,732,099	31½
1897	4,496,431	21,730,710	26,798,915	928,619	53,954,675	6
1898	5,247,913	19,159,482	26,102,616	809,056	51,319,067	*5
1899	4,819,157	21,786,835	40,941,906	909,410	68,457,308	33
1900	4,736,225	18,482,211	39,827,135	701,156	63,746,727	*7
1901	4,802,717	18,334,443	36,751,837	498,622	60,387,619	*5
Total	\$277,139,739	\$350,796,364	\$361,110,718	\$12,735,356	\$1001,782,177	

** Coining value. * Decrease. *** No annual compilations prior to 1881.

An analysis of the preceding figures leads one, even though unacquainted with the history of the State, to give to the industry the importance to which it is rightly entitled. To those actually concerned in the production of these metals throughout the State, the above figures offer much of satisfaction for the past and encouragement for the future.



BIG INDIAN MINE AND MILL, NEAR HELENA

LEAD, ZINC AND COPPER SMELTING.

(From the Report of the Twelfth Census.)

One of the most instructive statistical contributions that usually finds its way into print appeared in the advance pages of the Twelfth Census report relating to the smelting industry of the United States. It is valuable for its susceptibility to addition, subtraction and division which, according to the purpose of the investigator, will yield specific information to the commercialist or economic student, besides a wide range of facts relating to this familiar industry not commonly known. These statistics more properly, perhaps, belong to a manufacturing department, as they are classed by the Census Office, but since the smelting industry is so nearly inseparable from mineral production, it is concluded that for the purposes of this report, they may as well continue the hand in hand companionship that characterizes them in business life.

There being no zinc smelters in Montana no detailed tables relative to this industry are reproduced, all mention of them being confined to the general analysis. Complete tables relating to lead and copper smelters are reproduced in order that Montanas relative position among the states in these industries may be the better comprehended. The Census Office says:

The schedules of inquiry were designed to elicit complete data relative to the smelting and refining of the metal from the ore, and not to include any items of capital, wages, expenses, materials, etc., pertaining to mining, except as the same may be represented in the cost of the ore or concentrated mineral at the smelter.

In previous censuses attempts to segregate the mining and metallurgical branches of these industries and to report separately the statistics pertaining to each did not meet with a full measure of success. At the census of 1870 the work of smelting the ores and refining the resultant base metals was treated as manufacturing, and the data obtained included in the report on the manufactures. The scope and the method of the inquiry differed, however, in several important particulars from those employed at this census. At the censuses of 1880 and 1890 such a separation was not attempted except as incidental to the report on mining, and the results obtained are included in the reports on the mineral industries for those periods. Any comparison, therefore, that may be made of the statistics presented in this report with those for prior census periods will be of doubtful accuracy and value.

The statistics of the three branches of the industry, the smelting and refining of lead, copper, and zinc, are presented separately in the several tables under the respective designations, the totals being combined in the first table, which presents a summary for the three branches of the industry.

The smelting and refining plants are generally located with particular reference to proximity of the ore mines, availability of cheap and advantageous fuels, facilities for refining the base metals, convenience to a ready

market, etc.; and the natural division of the industry groups the establishments engaged into those located east and west of the Mississippi river, and this geographical division is shown in the statistics for each branch of the industry.

As explained in the text descriptive of the tables and industry, establishments engaged in lead smelting frequently report products of the precious metals, gold and silver, of greater value than the lead products, and this is true to a less extent in the copper smelting industry; in such cases, the fact that lead or copper ore is smelted is the sole factor considered in classifying the reports.

The report shows a capital of \$139,354,138 invested in the 117 establishments. This sum represents the value of land, buildings, machinery, tools, and implements, and the live capital utilized, but does not include the capital stock of any of the corporations reporting. The value of products is returned at \$358,786,472, to produce which involved an outlay of \$2,150,018 for the salaries of officials, clerks, etc.; \$15,973,626 for wages paid; \$3,088,007 for miscellaneous expenses, including rent, taxes, etc.; and \$279,655,350 for materials used, mill supplies, freight, and fuel. It is not to be assumed, however, that the difference between the aggregate of these sums and the value of the product is, in any sense, a measure of manufacturing profits in the industry during 1899. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of the mercantile losses incurred in the business, or of depreciation in plants. The value of the product given is the value as obtained or fixed at the works. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

An analysis of these results and a comparison with the totals for other manufacturing industries will disclose the fact that the cost of materials for a stated value of product is much greater than is generally found in other manufacturing industries; also, that the number of wage-earners and wages paid are much smaller proportionately. This is generally true of all industries, including petroleum refining, in which the line of demarcation between the mining and manufacture is difficult to define in statistical treatment.

Notwithstanding the absence of data for former censuses, that can be used for purposes of comparison with the statistics presented in this report, it can be stated with certainty that the three branches of the industry have kept pace with the general growth of manufacturing industries. Especially is this the case in copper smelting and refining, which has made remarkable progress, due largely to the increased use of the metal in the electrical industry and the discovery of new sources of ore.

In the earlier stages of the development of our resources of the base and precious metals, particularly in the Rocky Mountain region, the absence of railroads and the high cost of transportation made local metallurgical treatment a necessity. The mining of ores and the subsequent working of them were frequently carried on by the same individual, firm, or corporation, and it was difficult to ascertain the amount of capital invested in each, or make

a division of the aggregate labor of the establishment between the two processes, or estimate the value of the ore when charged into the smelter. These difficulties appear to have resulted in combining the statistics for mining,



CAGE AT WEST STEWART MINE, BUTTE.

and the milling and smelting and refining of ores at all prior censuses except that of 1870. At the census of 1870 a separation was made of the mining and manufacturing, and the treatment of the ores after their delivery from the mines was classed as manufacturing. The statistics for the two branches of the industry are again separated at the census of 1900, and those for the

smelting of ores and the refining and separation of the metals are included in the report on the manufactures. The statistics for mines, mining, and ore dressing will be presented in subsequent reports, to be published in conformity with section 8 of the Act of Congress of March 3, 1899, providing for taking the Twelfth and subsequent censuses.

The crushing and milling of quartz, the separation of gold and silver from the ore in concentrating and separating plants operated either under the cyanide process or other methods are so closely allied with the mining industry that the statistics will constitute a part of the report on mines and



FLORENCE MINE, NEIHART.

mining, and will not be included in the report on manufactures. With the exception of the extraction of iron from iron ore in blast furnaces, which will be treated in the special report on iron and steel, the statistics presented herewith include all the data collected by the Twelfth Census regarding the smelting of ores and refining of the crude metals or metal alloys obtained in smelting.

Copper and lead ores frequently contain paying quantities of gold and silver, and a large tonnage of the "dry ores" of gold and silver free from base metals is smelted with the lead and copper ores to facilitate the extraction of the metals. In these cases the base metals are merely the carriers for the precious metals. The reports for a number of the smelters and refiners show that the value of the precious metals exceeded the value of the base metals, while other reports show that the smelting of lead is only incidental to the extraction of the precious metals and the subsequent parting operation. If the principle were followed of classifying schedules according to the product of chief value, a number of those included in this report would be classified as refineries of gold and silver. The report, however, includes

the returns from all establishments in which copper or lead ore was smelted or refined, irrespective of the value of these baser metals as compared with the value of the other products of the establishment. From the reports of the copper and lead smelters and refiners, it appears that they produced 83,650,828 fine ounces of silver and 2,739,188 fine ounces of gold during the calendar year 1899. According to the report of the Director of the Mint, there were 54,764,500 ounces of silver and 3,437,210 ounces of gold produced during the calendar year 1899, but this does not include the product of the foreign ores and furnace materials treated in bond, and, on the other hand, the gold reported by the smelters does not include the products of placer mining or products that do not pass through the smelter, but which are included in the report of the Director of the Mint. Thus the amounts reported by the Director of the Mint are not comparable with those shown in this report.

Smelting and refining being reported as an adjunct to the mining industry at the census of 1890, no attempt was made to secure data which would be in harmony with the returns obtained for manufacturing industries, and it is therefore impossible to present comparable statistics for all the items reported for 1900.

If the three branches of the industry are ranked according to the value of their products, including the precious metals, lead stands first, copper second, and zinc third. The reports for each industry relate to the calendar year 1899, although in isolated instances the returns from individual producers were given for their fiscal years.

Table 1 is a consolidated summary of the totals for the 3 industries, lead, copper, and zinc smelting and refining.

TABLE 1.—SUMMARY FOR THE UNITED STATES OF THE LEAD, COPPER, AND ZINC SMIELTING INDUSTRIES.

	Total	Lead	Copper	Zinc
Number of establishments	117	39	47	31
Capital	\$139,354,138	\$72,148,933	\$53,063,395	\$14,141,810
Land	\$8,039,843	\$3,704,552	\$2,091,415	\$2,243,876
Buildings	\$43,116,399	\$21,974,850	\$15,670,959	\$5,470,590
Machinery, tools, and implements	\$34,187,168	\$26,480,025	\$5,771,389	\$1,935,754
Cash and sundries	\$54,010,728	\$19,989,506	\$29,529,632	\$4,491,590
Salaried officials, clerks, etc., number	1,121	425	488	208
Salaries	\$2,150,018	\$754,913	\$954,905	\$440,200
Wage-earners, average number	24,512	8,319	11,324	4,869
Total wages	\$15,973,626	\$5,088,684	\$8,529,021	\$2,355,921
Miscellaneous expenses	\$3,088,007	\$1,166,210	\$1,522,325	\$399,472
Cost of materials used	\$279,655,350	\$144,195,163	\$122,174,129	\$13,286,058
Value of products	\$358,786,472	\$175,466,304	\$165,131,670	\$18,188,498

LEAD SMELTING AND REFINING.

Table 2 shows the totals for the establishments reported at the Twelfth Census as engaged in the smelting and refining of lead.

TABLE 2.—LEAD SMELTING AND REFINING: SUMMARY FOR THE UNITED STATES.

	United States	Colorado	Missouri	Montana	All Other States and Territories*
Number of establishments	39	8	11	3	17
Capital	\$72,148,933	\$22,569,715	\$944,539	\$2,858,158	\$45,776,521
Land	\$3,704,552	\$1,057,264	\$107,000	\$63,334	\$2,476,954
Buildings	\$21,974,850	\$7,064,040	\$269,550	\$939,953	\$13,701,307
Machinery, tools and imple- ments	\$26,480,025	\$8,752,414	\$61,128	\$1,191,663	\$16,474,820
Cash and sundries ..	\$19,989,506	\$5,695,997	\$506,861	\$663,208	\$13,123,440
Salaried officials, clerks, etc., number	425	137	35	27	226
Salaries	\$754,913	\$288,119	\$47,360	\$73,818	\$345,616
Wage-earners, average number	8,319	3,316	474	563	3,966
Total wages	\$5,088,684	\$2,390,383	\$255,590	\$397,771	\$2,044,940
Miscellaneous expenses ..	\$1,166,210	\$154,001	\$41,565	\$47,626	\$923,018
Cost of material used** ..	\$144,195,163	\$33,996,975	\$3,317,558	\$4,835,771	\$102,044,859
Value of products**	\$175,466,304	\$40,732,271	\$3,852,435	\$5,264,253	\$125,617,345

* Includes establishments distributed as follows: California, 1; Idaho, 1; Illinois, 2; Iowa, 1; Kansas, 2; Nebraska, 1; New Jersey, 2; New Mexico, 1; Texas, 1; Utah, 2; Virginia, 1; Washington, 2.

** The difference between the cost of materials and value of product, as shown in Table 1, and as shown in Table 12, is caused by the duplication in the latter table of the intermediate product between the ore and the refined metal, amounting to \$25,508,203 in the United States, \$9,204,735 in Colorado, and \$16,303,468 in all other states.

In addition to the 39 active establishments shown in Table 2, there were 3 idle establishments with a capital of \$629,871, 1 located in Missouri, 1 in Nevada, and 1 in Utah.

Table 3 shows the quantities of domestic and foreign ores, and of base bullion, respectively, consumed by smelters and refineries in each of the states and territories in which the industry appeared in 1899.

TABLE 3.—QUANTITIES OF ORE SMELTED AND BASE BULLION REFINED AND DESILVERIZED.

STATES AND TERRITORIES	SMELTERS		REFINERS AND DESILVERIZERS	
	Domestic Ore	Foreign Ore	Domestic Base Bullion	Foreign Base Bullion
United States	Short t's 1,667,545	Short tons 284,914	Short tons 180,998	Short tons 78,939
California	34,860	5,600	10,462	.....
Colorado	1,050,957	932	25,794	.....
Idaho	3,402	.....	.....	.....
Illinois	90	.....	36,572	2,497
Iowa	400	.....	.....	.....
Kansas	19,278	.....	46,767	660
Missouri	68,719	.....	.....	.....
Montana	145,364	3,750	.....	.....
Nebraska	32,211	3,726	52,096	.....
New Jersey	149	12,921	8,428	74,313
New Mexico	15,122	.....	.....	.....
Texas	84,195	252,887	.....	.....
Utah	171,034	.....	.....	.....
Virginia	225	.....	.....	.....
Washington	41,439	5,098	879	1,469

As shown by Table 3, 284,914 tons, or but 14.6 per cent of the total quantity of ores consumed in smelters, were imported, while of the 259,937 tons of base bullion credited to refineries and desilverizers, 78,939 tons, or 30.4 per cent, were imported, a difference to be accounted for by the fact that considerable quantities of foreign ores are smelted before being sent into the country, only the refining and desilverizing being done here, almost



SHAFTER MILL, VIRGINIA CITY.

entirely in bond. Of the total quantity (284,914 tons) of foreign ores consumed in smelters, 252,887 tons, or 88.8 per cent, were consumed in Texas. A large part of this ore is imported from Mexico and smelted near the border. Of the 78,939 tons of foreign base bullion consumed in the refineries and desilverizers, 74,313 tons, or 94.1 per cent, were reported by the refineries of the state of New Jersey. How little of this foreign lead remains in the United States is shown by the fact that 148,300,164 pounds of foreign lead, valued at \$5,517,569, was desilverized and refined in bond and re-exported.

Table 4 shows the quantities of the different varieties of products for each of the states and territories appeared in 1899.

TABLE 4—QUANTITIES OF PRODUCTS, BY STATES.

STATES AND TERRITORIES	SMELTING				REFINING AND DESILVERING			
	Non-Argetiferous Ores		Argentiferous Ores		Hard or Antimonial Lead	All Other Lead (Including Dore Bars	Dore Bars, Contents of Precious Metals	
	Soft Lead	Lead Oxide	Lead Contents of Base Bullion	Silver	Gold	Copper Contents of Matte	Silver	Gold
	Pounds.	Pounds.	Pounds.	Oz. fine	Oz. fine	Pounds.	Oz. fine	Oz. fine
United States	90,473,286	10,329,804	402,324,605	52,641,752	1,322,177	26,964,311	70,420,917	2,514,836
California . . . . .	.....	.....	10,960,000	2,339,000	98,640	569,000	6,995,000	1,119,940
Colorado . . . . .	.....	.....	219,304,385	24,464,621	760,240	9,363,741	5,769,336	234,763
Idaho . . . . .	.....	.....	1,315,178	109,248	174	.....	.....	.....
Illinois	141,625	.....	.....	.....	.....	.....	.....	.....
Iowa	800,645	.....	.....	.....	.....	.....	.....	.....
Kansas	795,793	.....	21,842,738	2,208,295	88,622	1,619,706	.....	.....
Missouri	83,952,333	10,329,80	.....	.....	.....	.....	11,078,906	418,571
Montana . . . . .	.....	.....	40,853,057	4,356,099	54,415	791,162	.....	.....
Nebraska	4,237,312	.....	7,463,762	3,997,860	175,459	3,421,24	.....	.....
New Jersey	226,000	.....	1,523,330	2,043,033	8,825	150,000	14,352,804	402,127
New Mexico . . . . .	.....	.....	3,713,281	123,323	.....	3,58	22,405,696	188,063
Texas . . . . .	.....	.....	26,476,173	6,790,207	40,937	4,676,641	.....	.....
Utah . . . . .	.....	.....	51,053,513	4,982,919	42,112	6,014,360	.....	.....
Virginia	319,678	.....	.....	.....	.....	.....	.....	.....
Washington . . . . .	.....	.....	17,819,188	1,222,147	52,753	438,582	605,086	14,294

The most important fact indicated by this table is the geographical distribution of the two branches of the industry. This distribution in each case has but slight relation to the location of the mines producing the ores used, but the relation is least apparent in the case of the refineries and desilverizers. The location of lead smelters is largely decided by the abundance of



PENNSYLVANIA MINE, BUTTE

"dry ores" of the precious metals—ores which are free from lead—and by the abundance of fuel. These "dry ores" can be reduced more economically in lead smelters than is possible by amalgamation or other processes used for the extraction of gold and silver. There are a few relatively unimportant smelting plants in Idaho, Montana, New Mexico, and California, built to reduce the lead ores locally mined. The great mass of lead ore, however, is hauled, often great distances, to meet the fuel and to encounter "dry ores"



EAST STEWART MINE. BUTTE, LOOKING WEST.

of gold and silver. The principal large plants are in Colorado, Utah, and Montana. An excellent illustration of this movement is afforded by the famous Coeur d'Alene district in Idaho, which yields approximately one-quarter of the lead mined in the United States. Not a pound of this ore is smelted locally, the concentrates and ore being shipped for reduction to the smelters in Colorado, Montana, Utah, Nebraska, Illinois, and on Puget Sound. Thus the smelters of Colorado produced 219,304,385 pounds of lead, or 54.5 per cent of the lead produced from argentiferous ores in all the smelters of the country, 24,464,621 fine ounces of silver, and 760,240 fine ounces of gold, or 46.5 per cent, and 57.5 per cent, respectively, of the gold and silver product of all smelters. This preeminence is partly due to the large production of lead ores in Colorado, amounting to nearly one-third of the country's production in 1899,* but partly also to the large production of "dry

* Annual Report of U. S. Geological Survey, Part IV, Page 229.

ores" of gold and silver, and the production of coking coal, which latter, as explained above, combine to attract to this state lead ores mined in other parts of the country. The smelting of non-argentiferous or soft lead ores is very largely carried on in the state of Missouri, which is also the center of the region where these ores are chiefly mined. Of the entire production of soft lead, 83,952,833 pounds, or 92.8 per cent, came from the smelters of Missouri. In this state was also manufactured the entire product of lead oxide herein reported.

The distribution of refineries and desilverizers is very different from that of the smelters. While the smelting of argentiferous ores is centered largely in Colorado, Utah, and Montana, the refining and desilverizing is carried on more largely in New Jersey, Nebraska, and Kansas.

The detailed statistics for the smelting and refining industry, as reported at the census of 1900, are shown in Table 5. This table presents separate totals for each state in which there were 3 or more establishments, and groups the statistics for other states so as to not disclose the operations of individual establishments. The establishments are classified according to the character of the ownership, which shows that 5 were owned by individuals, 1 by partnership, and 33 by corporations. The employees are segregated so as to show for salaried officials and wage-earners separately the number and salaries or wages of men, women, and children, respectively, and also the average number of wage-earners employed during each month of the year. Separate totals are shown for the different materials and products of smelting and refining, respectively. Considerable quantities of ore are smelted or refined on contract. The amounts received for contract work, aggregating \$1,598,038, are given in the table, and the ores thus treated are included in the quantities and values of the materials and products. The number of engines, water wheels, etc., and their horsepower, are presented and the 39 establishments are grouped according to the number of employees in each.

TABLE 5—LEAD SMELTING AND REFINING, BY STATES AND TERRITORIES: 1899.

	United States	Colorado	Missouri	Montana	All Other States and Territories*
Number of establishments	39	8	11	3	17
Character of organization:					
Individual	5	.....	1	.....	4
Firm and limited partnership	1	.....	1	.....	.....
Incorporated company	33	8	9	3	13
Established during the decade	10	1	5	.....	4
Established during the census year .....	.....	.....	.....	.....	.....
Capital:					
Total value	\$72,148,933	\$22,569,715	\$944,539	\$2,858,158	\$35,776,521
Land	\$3,704,552	\$1,057,264	\$107,000	\$63,334	\$2,476,954
Buildings	\$21,974,850	\$7,064,040	\$269,550	\$939,953	\$13,701,307
Machinery, tools, and implements	\$26,480,025	\$8,752,414	\$61,128	\$1,191,663	\$16,474,820
Cash and sundries	\$19,989,506	\$5,695,997	\$506,861	\$663,208	\$13,123,440
Proprietors and firm members	7	.....	3	.....	4
Salaried officials, clerks, etc.:					
Total number	425	137	35	27	226
Total salaries	\$754,913	\$288,119	\$47,360	\$73,818	\$345,616
Officers of corporations—					
Number	20	.....	8	4	8
Salaries	\$66,905	.....	\$15,200	\$17,700	\$34,005
General superintendents, managers, clerks, and salesmen—					
Total number	405	137	27	23	218
Total salaries	\$688,008	\$288,119	\$32,160	\$56,118	\$311,611
Men—					
Number	402	137	26	22	217
Salaries	\$685,428	\$288,119	\$31,560	\$54,853	\$310,891
Women—					
Number	3	.....	1	1	1
Salaries	\$2,580	.....	\$600	\$1,260	\$720
Wage-earners, including pieceworkers, and total wages:					
Greatest number employed at any one time during the year	10,143	4,247	598	717	4,581
Least number employed at any one time during the year	6,778	2,539	398	464	3,377
Average number	8,319	3,316	474	563	3,966
Wages	\$5,088,684	\$2,390,383	\$255,590	\$97,771	\$2,014,900
Men, 16 years and over—					
Average number	8,312	3,316	473	563	3,960
Wages	\$5,086,704	\$2,390,383	\$255,362	\$97,771	\$2,043,188
Children, under 16 years—					
Average number	7	.....	1	.....	6
Wages	\$1,980	.....	\$228	.....	\$1,752
Average number of wage-earners, including pieceworkers, employed during each month:					

LEAD SMELTING AND REFINING Continued.

	United States	Colorado	Missouri	Montana	All Other States and Territories
Men, 16 years and over—					
January	8,806	3,655	399	601	4,148
February	8,186	3,444	381	584	3,774
March	8,283	3,295	481	568	4,093
April	8,565	3,505	487	525	4,048
May	8,018	3,240	427	543	3,808
June	7,339	2,470	466	515	3,879
July	7,139	2,240	526	488	3,885
August	8,068	3,277	499	453	3,842
September	8,608	3,630	563	515	3,939
October	8,779	3,690	514	601	3,974
November	8,946	3,670	487	617	4,142
December	8,915	3,734	498	715	3,968
Children, under 16 years—					
January	7	.....	1	.....	6
February	7	.....	1	.....	6
March	7	.....	1	.....	6
April	7	.....	1	.....	6
May	7	.....	1	.....	6
June	7	.....	1	.....	6
July	7	.....	1	.....	6
August	7	.....	1	.....	6
September	7	.....	1	.....	6
October	7	.....	1	.....	6
November	7	.....	1	.....	6
December	7	.....	1	.....	6
Miscellaneous expenses:					
Total	\$1,166,210	\$154,001	\$41,565	\$47,626	\$923,018
Rent of works	\$2,626	.....	.....	.....	\$2,626
Taxes, not including internal revenue	\$86,390	\$32,269	\$5,601	\$3,596	\$39,924
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	\$1,077,194	\$121,732	\$35,964	\$39,030	\$88,468
Material used**					
Aggregate cost	\$169,703,366	\$43,201,710	\$3,317,558	\$4,835,771	\$118,348,324
Smelters—					
Total cost	\$65,789,219	\$33,166,211	\$3,285,190	\$4,308,806	\$25,029,012
Ores—					
Domestic—					
Tons	1,667,545	1,050,957	68,719	145,364	402,505
Cost	\$53,532,321	\$30,862,018	\$3,124,394	\$3,676,436	\$15,569,473
Foreign—					
Tons	284,914	932	.....	3,750	280,232
Cost	\$7,336,159	\$313,385	.....	\$184,099	\$6,538,675
Fuel	\$3,191,236	\$1,392,316	\$104,607	\$356,380	\$1,337,983

LEAD SMELTING AND REFINING--Continued.

	United States	Colorado	Missouri	Montana	All Other States and Territories*
Rent of power and heat	\$26,446	.....	.....	\$13,958	\$12,488
Mill supplies	\$504,530	\$344,059	\$16,010	\$28,345	\$116,116
All other material	\$1,198,527	\$254,433	\$40,179	\$49,588	\$854,327
Refiners and desilverizers:					
Total cost	\$102,096,628	\$9,939,214	.....	.....	\$92,157,414
Base bullion--					
Domestic--					
Tons	180,998	\$25,794	.....	.....	155,204
Cost	\$80,940,771	\$9,879,781	.....	.....	\$71,060,990
Foreign--					
Tons	78,939	.....	.....	.....	78,939
Cost	\$19,861,733	.....	.....	.....	\$19,861,733
Fuel	\$250,519	\$18,435	.....	.....	\$232,084
Mill supplies	\$104,670	\$9,183	.....	.....	\$95,487
All other materials	\$938,935	\$31,815	.....	.....	\$907,120
Freight	\$1,817,519	\$96,285	\$32,368	\$526,965	\$1,161,901
Products:**					
Aggregate value	\$200,974,507	\$49,937,006	\$3,852,435	\$5,264,253	\$141,920,813
Smelting--					
Total value	\$81,430,717	\$39,772,746	\$3,852,435	\$5,264,253	\$32,541,283
Non-argenteriferous ores--					
Total value	\$4,114,336	.....	\$3,852,435	.....	\$261,901
Soft lead--					
Pounds	90,473,286	.....	83,952,833	.....	6,520,453
Value	\$3,801,242	.....	\$3,539,341	.....	\$261,901
Lead oxide--					
Pounds	10,329,804	.....	10,329,804	.....	.....
Value	\$299,201	.....	\$299,201	.....	.....
All other products non-argenteriferous ores--					
Value	\$13,893	.....	\$13,893	.....	.....
Contract work on non-argenteriferous ores	\$25,382	.....	\$25,382	.....	.....
Argenteriferous ores--					
Total value	\$77,316,381	\$39,772,746	.....	\$5,264,253	\$32,279,382
Lead contents of base bullion--					
Pounds	402,324,605	219,304,385	.....	40,853,057	142,167,163
Value	\$15,546,661	\$8,613,296	.....	\$1,382,515	\$5,550,830

** The differences between the cost of materials, and also for value of products for Colorado, all other states, and the United States total as shown above, and as shown in Table 1, is caused by the duplication in the above table, under the heads of "refining and desilverizing base bullion," and "smelting argenteriferous ores," to the amount of \$9,204,735 for Colorado, \$16,303,463 for all other states, and \$23,908,203 for the United States, which amounts represent the intermediate product between the ore and the refined metal. (* See page 295.)

LEAD SMELTING AND REFINING Continued.

	United States	Colorado	Missouri	Montana	All Other States and Territories
Silver—					
Ounces fine	52,641.75	24,464.62	.....	4,356.09	23,821.62
Value	\$1,185,001	\$14,680,889	.....	\$2,390,556	\$13,955,158
Gold—					
Ounces fine	1,322.77	760.24	.....	54.415	507.522
Value	\$26,538.11	\$15,194,872	.....	\$1,088,992	\$10,244,307
Copper contents of matte—					
Pounds	26,934.631	9,269,711	.....	791,162	16,963,125
Value	\$3,768,472	\$1,276,850	.....	\$76,881	\$2,414,671
All other products of argentiferous ores—					
Value	\$287,944	\$6,839	.....	\$165,319	\$115,796
Contract work on argentiferous ores—					
Amount received	\$118,467	.....	.....	.....	\$118,467
Refining and desilverizing—					
Total value	\$119,543,791	\$10,161,260	.....	.....	\$109,379,539
Hard or antimonial lead—					
Pounds	16,785,097	1,402,948	.....	.....	15,382,149
Value	\$701,082	\$59,156	.....	.....	\$641,926
All other lead (including Dore bars)—					
Pounds	480,670,884	42,723,944	.....	.....	437,946,800
Value	\$2,0672,149	\$1,822,735	.....	.....	\$18,849,405
Dore bars, contents of precious metals—					
Silver—					
Ounces fine	70,420.917	5,769,336	.....	.....	64,651,581
Value	\$2,143,763	\$3,429,993	.....	.....	\$38,713,710
Gold—					
Ounces fine	2,514,836	234,763	.....	.....	2,280,673
Value	\$2,010,121	\$1,852,376	.....	.....	\$17,156,745
All other products of refining and desilverizing—					
Value	\$4,016,744	.....	.....	.....	\$4,016,744
Contract work on refining and desilverizing—					
Amount received	\$1,454,249	.....	.....	.....	\$1,454,249
Foreign lead smelted or refined in bond and re-exported—					
Pounds	148,300,164	.....	.....	.....	148,300,164
Value	\$5,517,539	.....	.....	.....	\$5,517,539
Power:					
Number of establishments reporting	36	7	9	3	17
Owned—					
Total horsepower	16,952	7,500	830	1,295	7,217
Engines—					
Steam:					
Number	171	60	21	4	86
Horsepower	13,948	6,747	830	500	5,871

LEAD SMELTING AND REFINING--Continued.

	United States	Colorado	Missouri	Montana	All Other States and Territories*
Gas or gasoline--					
Number	5	2	.....	.....	3
Horsepower	159	89	.....	.....	70
Water wheels--					
Number	14	5	.....	1	8
Horsepower	373	92	.....	40	241
Electric motors--					
Number	12	4	.....	.....	8
Horsepower	610	235	.....	.....	375
Other power--					
Horsepower	452	427	.....	.....	25
Rented horsepower	1,410	.....	.....	755	65
Establishments classified by number of persons employed, not including proprietors and firm members:					
Total number of establishments	39	8	11	3	17
Under 5	3	.....	2	.....	1
5 to 20	4	.....	1	.....	3
21 to 50	6	.....	4	.....	1
51 to 100	4	.....	2	1	2
101 to 250	8	.....	2	1	3
251 to 500	6	2	.....	.....	4
501 to 1,000	5	2	.....	1	2
Over 1,000	3	2	.....	.....	1

* Includes establishments distributed as follows: California, 1; Idaho, 1; Illinois, 2; Iowa, 1; Kansas, 2; Nebraska, 1; New Jersey, 2; New Mexico, 1; Texas, 1; Utah, 2; Virginia, 1; Washington, 2.

COPPER SMELTING AND REFINING.

The production of copper in the United States during the year 1899 was the largest in the history of the industry. The rapid increase of production dates from 1879, when the annual product amounted to 23,000 long tons. It increased to 101,239 long tons in 1889 and 269,016 long tons in 1899. The magnitude of the industry in 1899 is indicated by the statistics given in Table 6, which shows the totals for the United States and for each state and territory in which there were three or more establishments during that year.

TABLE 6—COPPER SMELTING AND REFINING: SUMMARY FOR THE UNITED STATES.

	United States	Arizona	California	Co'orado	Michigan	Montana	New Jersey	All Other States and Territories*
Number of establishments	47	9	3	3	3	7	7	15
Capital:								
Total	\$53,043,395	\$7,265,659	\$1,114,882	\$2,308,309	\$1,523,407	\$26,824,298	\$6,943,886	\$7,082,954
Land	\$2,091,415	\$122,366	\$11,560	\$99,993	\$35,000	\$309,346	\$854,154	\$659,151
Buildings	\$15,670,959	\$965,024	\$278,734	\$63,885	\$1,096,107	\$9,135,526	\$1,568,545	\$1,943,138
Machinery, tools and implements	\$5,771,389	\$515,937	\$131,845	\$49,238	\$196,307	\$2,349,499	\$970,991	\$1,177,572
Cash and sundries	\$29,529,632	\$5,662,432	\$692,803	\$1,155,188	\$195,993	\$14,969,927	\$3,550,196	\$3,303,093
Salaries of officials, clerks, etc., number	488	80	21	30	17	107	74	159
Salaries	\$954,905	\$140,621	\$25,357	\$59,765	\$25,500	\$233,711	\$138,728	\$331,223
Wage-earners, average number	11,324	1,648	381	410	462	4,290	1,707	2,426
Total wages	\$8,529,021	\$1,276,739	\$342,491	\$315,958	\$364,647	\$3,791,983	\$915,112	\$1,522,091
Miscellaneous expenses	\$1,522,325	\$266,548	\$90,026	\$11,547	\$33,685	\$556,852	\$290,423	\$2,302,244
Cost of materials used	\$122,174,129	\$6,370,884	\$1,379,423	\$3,385,113	\$16,754,220	\$20,556,336	\$32,545,179	\$41,182,974
Value of products	\$165,131,679	\$17,286,517	\$4,508,259	\$3,993,034	\$17,340,041	\$36,337,063	\$38,365,131	\$47,351,625

* Includes establishments distributed as follows: Connecticut, 2; Illinois, 1; Maryland, 1; Nevada, 1; New Mexico, 1; New York, 2; Ohio, 1; South Dakota, 1; Tennessee, 1; Utah, 2; Virginia, 1; Washington, 1.



LEONARD MINE, BUTTE

In addition to the 47 active establishments shown in the foregoing table, there were 9 idle establishments with a capital of \$371,320; 4 located in Arizona, 1 in California, 1 in Illinois, and 3 in Nevada. The statistics given in Table 6 include all establishments engaged in the smelting or refining of copper, but, as in the case of lead smelting or refining, the product of the precious metals in some of these establishments exceeds in value the copper product. In connection with the smelting of copper, 25 establishments smelted 8,866,472 fine ounces of silver and 23 smelted 300,914 fine ounces of gold. Of the refineries, 11 reported a product of 13,229,911 fine ounces of silver and 10 a product of 224,352 fine ounces of gold. The total value of the gold and silver reported by the 47 establishments was \$23,257,961, being 14.1 per cent of \$165,131,670, the aggregate value of all products. The aggregate



BALD BUTTE MINING COMPANY'S MILL AT BALD BUTTE.

value of products is the sum of the products of the smelters and refineries, respectively.

Large quantities of ore are smelted, and large quantities of metal are refined on contract. It appears from Table 12 that the smelters and refineries received \$293,961 and \$3,452,855, respectively, for this class of work. While in such cases the ore or metal is not purchased nor the finished product owned by the establishments doing the work, nevertheless it is necessary to report the quantities and cost of both in order to ascertain the total quantities and cost of ore and base metal treated and of finished products manufactured in the United States. Therefore all establishments were required to report the total quantities and cost of all materials that passed through the respective plants and the total quantities and values of all their products, irrespective of the ownership. Establishments doing contract work were also required to report the amount received for such work and these amounts are shown as separate items under products in Table 12.

While the industry has made rapid progress during the past twenty

years, the statistics concerning capital, employees, wages, and products shown in the reports on mineral industries at the census of 1880 and 1890 are so meager that they can not be used for comparison with those for 1900.

In the absence of other trustworthy data, the quantity of copper produced must be accepted as indicating the extent of the increase in the industry. Table 7, taken from the report of the Geological Survey on "The Production of Copper in 1899," shows the quantity of copper produced in each year from 1845 to 1899, inclusive.

TABLE 7.—PRODUCTION OF COPPER IN THE UNITED STATES FROM 1845 TO 1899.

YEAR	Total Production, United States	Lake Superior	Percentage of Lake Superior of Total Product	YEAR	Total Production, United States	Lake Superior	Percentage of Lake Superior of Total Product
1845	Long tons, 100	Long tons, 12	12.0	1863	Long tons, 8,500	Long tons, 5,797	68.2
1846	150	26	17.3	1864	8,000	5,576	69.7
1847	300	213	71.0	1865	8,500	6,410	75.4
1848	500	461	92.2	1866	8,900	6,138	69.0
1849	700	672	96.0	1867	10,000	7,824	78.2
1850	650	572	88.0	1868	11,600	9,346	80.6
1851	900	779	86.6	1869	12,500	11,886	95.1
1852	1,100	792	72.0	1870	12,600	10,992	87.2
1853	2,000	1,297	64.9	1871	13,000	11,912	91.9
1854	2,250	1,819	80.8	1872	12,500	10,951	87.6
1855	3,000	2,593	86.4	1873	15,500	13,433	86.7
1856	4,000	3,666	91.7	1874	17,500	15,327	87.6
1857	4,800	4,255	88.6	1875	18,000	16,089	89.4
1858	5,500	4,088	74.3	1876	19,000	17,085	89.9
1859	6,300	3,985	63.3	1877	21,000	17,422	83.0
1860	7,200	5,388	74.3	1878	21,500	17,719	82.4
1861	7,500	6,113	81.5	1879	23,000	19,129	83.2
1862	9,000	6,065	67.4	1880	27,000	22,204	82.2

TABLE 7—PRODUCTION OF COPPER IN THE UNITED STATES FROM 1845 TO 1899—Continued.

YEAR	Total Production, United States....	Lake Superior....	Percentage of Lake Superior of Total Product.....	Montana.....	Percentage of Montana of Total Product.....	Arizona.....	Percentage of Ari- zona of Total Product.....
	Long tons	Long tons		Long tons		Long tons	
1881	32,000	24,363	76.1	.....	.....	.....	.....
1882	40,467	25,439	62.9	.....	.....	.....	.....
1883	51,574	26,653	51.6	11,011	21.3	10,658	20.7
1884	64,708	30,911	47.8	19,256	29.8	11,935	18.4
1885	74,052	32,209	43.5	30,267	40.9	10,137	13.7
1886	70,430	36,124	51.3	25,362	36.0	6,990	9.9
1887	81,017	33,941	41.9	35,133	43.4	7,910	9.7
1888	101,054	38,604	38.2	43,704	43.2	14,195	14.0
1889	101,239	39,364	38.7	43,849	43.3	13,654	13.5
1890	115,966	45,213	38.9	50,437	43.5	15,531	13.4
1891	126,839	50,932	40.2	50,028	39.5	17,800	14.0
1892	154,018	54,999	35.7	72,360	47.3	17,160	11.1
1893	147,033	50,270	34.2	69,290	47.1	19,200	13.1
1894	158,120	51,031	32.3	81,729	51.6	19,873	12.6
1895	169,917	57,731	34.0	84,900	50.0	21,408	12.6
1896	205,384	64,073	31.2	99,071	48.2	32,560	15.8
1897	220,511	64,858	29.4	102,807	46.6	36,393	16.5
1898	235,050	66,291	28.2	92,041	39.2	49,624	21.1
1899	253,870	65,803	25.9	100,503	39.6	59,399	23.4

As shown in Table 7, the production of copper in the United States during the year 1899, reported to the United States Geological Survey, amounted to 253,870 long tons; this included the copper contents of blue vitriol, and also the copper reported as a by-product of lead smelters. The refined copper product shown in this report as "ingots, wire, bars, etc." amounts to 602,595,113 pounds, or 269,016 long tons. There were also 27,298,926 pounds of blue vitriol reported, and allowing one-fourth as representing the copper contents, gives 6,824,732 pounds, or 3,047 long tons of copper, making an aggregate product of 272,063 long tons. This, however, includes the copper extracted from imported ores and mattes, while the report of the United States Geological Survey deals only with copper of domestic origin. Practically all of the copper matte reported by the lead smelting works appears as raw material in the returns of the copper refineries.

Prior to 1879 the larger part of the copper product was obtained from the Lake Superior region, but since that date the percentage obtained from that district has been steadily decreasing, although its production has increased more than three-fold. The discovery of the rich deposits in Arizona, Montana, and other localities has caused a wider distribution of the industry.

While the location of the establishments engaged in copper smelting is controlled very largely by the source of the ore, still, in many cases the ore is transported to meet other materials or more favorable conditions for smelting. The products of the smelters are again transported to refineries, which are situated in localities more convenient for securing the materials used in the processes and are in closer touch with the market for the finished products. These conditions have caused a wide distribution of the estab-

lishments and have tended to specialize and localize the two branches of the industry.

Twenty-eight of the 47 establishments engaged in the industry are located west of the Mississippi river and their product was valued at \$67,299,654, or 40.8 per cent of the total. All the establishments west of the Mississippi were engaged in smelting, 25 of them in smelting exclusively,



STEEL GALLOWS FRAME, DIAMOND MINE, BUTTE.

and 3 in both smelting and refining, their proximity to the source of the ore resulting in the development of this branch of the industry. Their smelting product amounted to \$53,135,033, or 97.9 per cent of the \$54,275,173 reported as the product of all smelters. The fine copper contents of the blister and matte reported by the establishments in the western states amounted to 328,109,025 pounds, 98 per cent of the total.

While the smelting industry is largely confined to the establishments located in the western states, the refining is peculiar to the establishments in the eastern states. Of the 19 establishments east of the Mississippi, 16 were refineries and their product amounted to \$93,470,626, or 86.8 per cent of the \$107,635,247 reported as the product of all refining. There were 7 refineries located in the state of New Jersey, their refined product, not including

by-products, amounting to \$35,149,583, or 32.7 per cent of the total product of refineries. Montana was the only western state in which ingots, wire, bars, and finished refined products were made, the product of the State amounting to 95,404,468 pounds. The remaining 507,190,645 pounds of refined copper were manufactured in the eastern states.

Michigan appears in the tables with only a part of the product of the Lake Superior district, since a considerable part of the native copper or "mineral produced is shipped east for refining. The statistics of the stamp mills and concentrating plants of Lake Superior are not included in this investigation. It is a fact, however, that the native copper produced by the Lake Superior mines goes almost entirely to a number of refineries which treat no other copper material. Segregating these, we have the following statistics:

REFINING LAKE SUPERIOR MINERAL.

Expenditures:	
Wages	\$475,501
Superintendence..	49,703
Fuel	163,843
Supplies and materials, not including cost of "mineral"	195,364
Rent, interest, insurance, etc	49,368
Total	\$933,779
"Mineral" treated, short tons	121,243
Refined copper product, pounds	157,940,824

The foregoing statistics show the average expenditure per pound of refined copper to be .591 of a cent.

In recent years the increasing utilization by concentration of the finer slimes of the stamp mills had led to the production of lower grades of "mineral." This is reflected in the statistics, which show that the mineral treated by the refineries averaged 65.1 per cent of copper.

TABLE 8—MATERIALS USED, BY STATES.

STATES AND TERRITORIES	Ores	Matte Purchased	Blister or Anodes Purchased
	Tons.	Tons.	Tons.
United States	4,039,315	48,182	284,020
Arizona	752,642	1,413	.....
California	223,251	20	.....
Colorado	159,729	.....	.....
Connecticut .....	.....	824	14,743
Illinois .....	.....	2,400	.....
Maryland.....	.....	32	75,165
Michigan .....	.....	.....	83,852
Montana	2,442,636	2,795	.....
Nevada	19,071	.....	.....
New Jersey	3,766	29,778	72,817
New Mexico	23,048	.....	.....
New York	45,000	10,920	37,391
Ohio .....	.....	.....	.....
South Dakota	124,132	.....	.....
Tennessee	85,723	.....	.....
Utah	65,292	.....	.....
Virginia	5,025	.....	.....
Washington.....	90,000	.....	.....

The large consumption of ore in the western states is, of course, due to the proximity of the mines; the quantity used in these states amounted to 3,899,801 long tons, or 96.5 per cent of the total. The greater part of the ores used in the eastern states is imported. The smelters in the State of Montana reported 2,442,636 long tons of ores, or 60.5 per cent of the total of all ores treated. The smelters in Arizona rank second in the quantity of ore



CONCENTRATOR AT NEIHART.

consumed, reporting 752,642 long tons. California, with 223,251 long tons, ranks third; Colorado, with 159,729, fourth; and South Dakota, with 124,132 long tons, fifth, a considerable part of the ore of the latter state having been drawn from Montana. The refineries located in New Jersey, Michigan, Maryland, and New York are, in the order named, the largest consumers of matte and blister.

There were 26 establishments which reported ore and 13 of which reported matte and blister or anodes as the only component materials used during the census year. The remaining 8 establishments used both classes of materials.

Table 9 shows each item of cost and the percentage which it forms of the total cost for each of the classes of establishments.

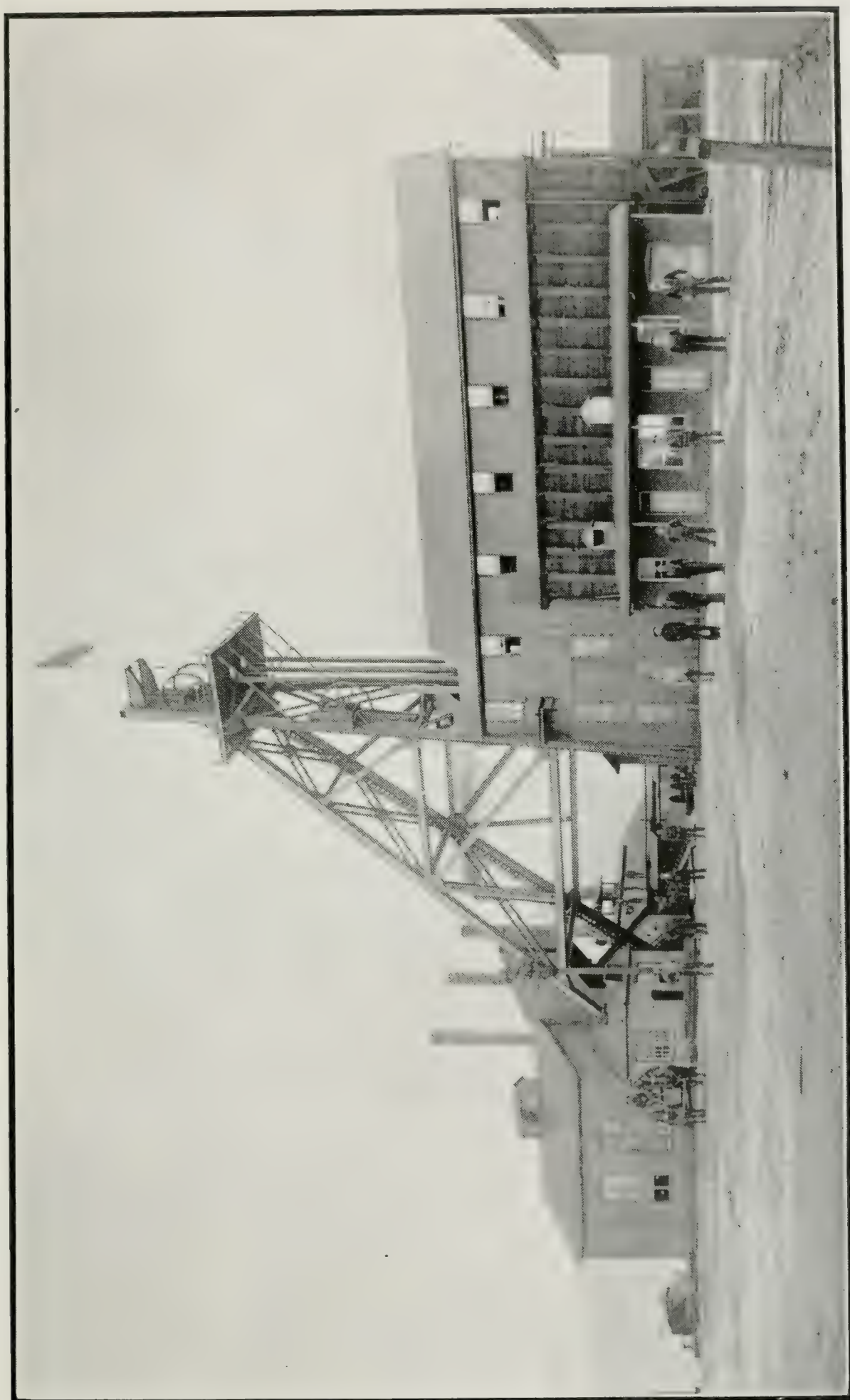
TABLE 9—SALARIES, WAGES, MISCELLANEOUS EXPENSES, AND MATERIALS FOR ESTABLISHMENTS CLASSIFIED ACCORDING TO MATERIALS USED.

	ALL ESTABLISHMENTS		USING ORES ONLY		USING MATTE AND BLISTER OR ANODES ONLY		ALL OTHER ESTABLISHMENTS	
	Amount	Per Cent of Total	Amount	Per Cent of Total	Amount	Per Cent of Total	Amount	Per Cent of Total
Total	\$133,180,380	100.00	\$38,048,388	100.00	\$75,899,853	100.0	\$18,232,139	100.0
Salaries	954,905	0.7	494,695	1.3	211,031	0.3	249,179	1.4
Wages	8,529,421	6.4	5,586,784	14.3	1,398,006	1.8	1,549,231	8.5
Miscellaneous expenses	1,522,325	1.2	938,139	2.4	192,272	0.3	391,914	2.1
Materials	122,174,129	91.7	32,028,770	82.0	74,103,544	97.6	16,041,815	88.0

Table 10 shows the quantities of each product for both in each state and territory.

TABLE 10—PRODUCTS BY STATES.

STATES AND TERRITORIES	SMELTING				REFINING			
	Fine Copper Contents of Blister or Anodes	Fine Copper Contents of Matte	Silver	Gold	Ingot, Wire, Bars, Etc.	Blue Vitriol	Silver	Gold
	Pounds.	Pounds.	Oz. fine.	Oz. fine.	Pounds.	Pounds.	Oz. fine.	Oz. fine.
United States	197,056,734	137,622,709	8,866,472	300,914	602,595,113	27,298,926	13,229,911	21,312
Arizona	75,127,116	62,832,952	711,373	18,074	.....	1,281,313	.....	.....
California	84,000	25,863,637	427,315	23,328	.....	.....	.....	.....
Connecticut .....	.....	.....	.....	.....	29,950,425	.....	.....	.....
Colorado .....	.....	21,212,797	728,334	71,336	.....	.....	.....	.....
Illinois .....	.....	.....	.....	.....	4,517,647	.....	.....	.....
Maryland .....	.....	.....	.....	.....	133,619,824	11,199,311	2,348,582	11,886
Michigan .....	.....	.....	.....	.....	102,001,189	.....	.....	.....
Montana	112,775,861	24,492,199	6,022,031	45,781	95,404,468	.....	3,026,888	10,612
Nevada .....	.....	536,075	30,985	249	.....	.....	.....	.....
New Jersey	2,930,100	.....	301,800	3,453	170,226,925	1,818,272	7,594,285	150,919
New Mexico .....	.....	3,869,082	125,482	6,252	.....	.....	.....	.....
New York .....	.....	.....	.....	.....	66,774,635	13,000,000	300,156	51,003
Ohio .....	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota .....	.....	2,175,549	317,263	84,723	.....	.....	.....	.....
Tennessee .....	.....	3,408,618	.....	.....	.....	.....	.....	.....
Utah	6,139,757	.....	88,202	7,625	.....	.....	.....	.....
Virginia .....	.....	231,800	3,687	33	.....	.....	.....	.....
Washington .....	.....	3,000,000	100,000	40,000	.....	.....	.....	.....



MOUNTAIN VIEW MINE, BUTTE

As shown by Table 10, a refined copper product of ingots, wire, bars, etc., was manufactured in 7 states, the largest product, 170,326,925 pounds, being reported for the state of New Jersey. The 4 eastern states, Connecticut, Maryland, New Jersey, and New York, produced 400,671,809 pounds, or 66.5 per cent of the total, while the 3 western states, Illinois, Michigan, and Montana, produced 201,923,304 pounds, or 33.5 per cent of the total. The



GENERAL VIEW OF THE ORIGINAL MINE, BUTTE.

table shows that 26,017,613 pounds, or 95.3 per cent of the total product, of blue vitriol were manufactured in the 3 eastern states, Maryland, New Jersey, and New York, the remaining 1,281,313 pounds being reported from Arizona. Table 10 also shows the large quantities of partially finished product, blister or anodes, and matte manufactured in the western states. This class of product is shown for twelve states and territories, 9 of them being west of the Mississippi river. Of the total, 334,679,443 pounds, reported as the fine copper contents of blister or anodes or matte, 328,109,025 pounds, or 98 per cent, were made in the western states and 6,570,418 pounds, or 2 per cent, in the eastern states.

As previously explained, the items of expenses shown in the census reports do not cover all the expenses of the establishments reported, no cognizance being taken of the cost of selling the product, of mercantile losses incurred, or of depreciation in plant; nevertheless, the items reported

bear a certain relation to each other and to the total for the United States, according to the branch of the industry in which the establishment is engaged. For instance, in establishments engaged in smelting exclusively, the proportional expenditure for labor will be larger, and for materials less, than in establishments engaged exclusively in refining.

TABLE II—SALARIES, WAGES, MISCELLANEOUS EXPENSES, AND MATERIALS FOR ESTABLISHMENTS CLASSIFIED ACCORDING TO PROCESS EMPLOYED.

	ALL ESTABLISHMENTS		SMELTING		REFINING		SMELTING & REFINING	
	Amount	Per Cent of Total	Amount	Per Cent of Total	Amount	Per Cent of Total	Amount	Per Cent of Total
Total	\$133,180,380	100.0	\$23,191,916	100.0	\$82,887,533	100.0	\$27,109,911	100.0
Salaries	954,905	0.7	435,784	1.9	335,526	0.4	183,595	0.7
Wages	8,529,021	6.4	3,576,429	15.4	1,895,705	2.3	3,056,887	11.3
Miscellaneous expenses	1,522,325	1.2	621,553	2.7	388,243	0.5	512,509	1.8
Materials	122,174,129	91.7	18,558,130	80.0	80,268,059	96.8	23,347,940	86.2

The detailed statistics for the industry as reported at the census of 1900 are shown in Table 12. This table presents separate totals for each state in which there were 3 or more establishments, and groups the statistics for other states so as not to disclose the operations of individual establishments. The establishments are classified according to ownership, which shows that 1 was owned by an individual, 3 by firms or partnerships, and 43 by corporations. The employees are classified so as to show for salaried officials and wage-earners separately the number, salaries, and wages of men, women, and



PROSPECTING FOR PLACER GOLD.

children, respectively, and also the average number of wage-earners employed during each month of the year. Separate totals are shown for the different materials and products of smelting and refining, respectively, and also the amounts received for contract work on the different classes of products, but, as previously explained, the quantities and values of the ores smelted or refined on contract are included in the quantities and values of the materials and products. The number of engines, water wheels, etc., and their horsepower are presented, and the 47 establishments are grouped according to the number of employees in each.

TABLE 12—COPPER SMELTING AND REFINING, BY STATES AND TERRITORIES: 1899.

	United States	Arizona	California	Colorado	Michigan	Montana	New Jersey	All Other States and Territories
Number of establishments	47	9	3	3	3	7	7	15
Character of organization:								
Individual	1							1
Firm and limited partnership	3	1	1					
Incorporated company	43	8	2	3	3	7		14
Established during the decade	23	5	2	2	1	1		9
Established during the census year	4							4
Capital:								
Total	\$53,063,395	\$7,265,659	\$1,114,882	\$2,308,309	\$1,523,407	\$26,824,298	\$6,943,886	\$7,082,954
Land	\$2,091,415	\$122,266	\$11,500	\$99,998	\$25,400	\$309,346	\$854,154	\$659,151
Buildings	\$15,670,959	\$965,024	\$278,731	\$623,885	\$1,096,107	\$9,195,526	\$1,568,545	\$1,943,158
Machinery, tools and implements	\$5,771,389	\$515,937	\$131,845	\$49,232	\$196,307	\$2,349,499	\$970,941	\$1,177,592
Cash and sundries	\$29,529,632	\$5,662,432	\$692,803	\$1,155,188	\$135,993	\$14,969,927	\$3,550,196	\$3,394,033
Proprietors and firm members	4				1		2	1
Salaries:								
Total number	488	80	21	30	17	107	74	159
Total salaries	\$954,905	\$140,621	\$25,357	\$59,763	\$25,500	\$233,711	\$138,728	\$331,223
Officers of corporations:								
Number	64	19	3	3		7	10	22
Salaries	\$308,975	\$38,283	\$1,490	\$7,709		\$69,500	\$69,880	\$131,122
General superintendents, managers, clerks, and salesmen:								
Total number	424	61	18	27	17	100	64	137
Total salaries	\$645,930	\$102,338	\$23,867	\$52,062	\$35,500	\$159,531	\$75,848	\$192,949
Men:								
Number	410	61	18	27	17	95	61	131
Salaries	\$632,118	\$102,338	\$23,867	\$52,065	\$35,500	\$159,531	\$75,848	\$192,949
Women:								
Number	14					5	3	6
Salaries	\$13,812					\$4,680	\$1,980	\$6,152
Wage-earners, including pieceworkers and total wages:								
Greatest number employed at any time during the year	13,624	1,988	447	486	514	5,313	2,103	2,783
Least number employed at any one time during the year	9,527	1,404	335	310	410	3,602	1,275	2,181
Average number	11,324	1,648	381	410	462	4,290	1,707	2,426
Wages	\$8,529,021	\$1,276,739	\$342,491	\$315,958	\$364,647	\$3,791,983	\$915,112	\$1,522,091
Men, 16 years and over:								
Average number	11,272	1,648	381	410	462	4,258	1,707	2,448
Wages	\$8,509,896	\$1,276,739	\$342,491	\$315,958	\$364,647	\$3,777,328	\$914,812	\$1,517,920
Women, 16 years and over:								
Average number	1					1		
Wages	\$2,540					\$2,500		

TABLE NO. 12—COPPER SMELTING AND REFINING, BY STATES AND TERRITORIES: 1899—Continued.

	United States	Arizona	California	Colorado	Michigan	Montana	New Jersey	All Other States and Territories*
Children, under 16 years:								
Average number	48					28	2	18
Wages	\$16,626					\$12,155	\$300	\$1,171
Average number of wage-earners, including pieceworkers, employed during each month:								
Men, 16 years and over:								
February	10,735	1,632	370	422	469	4,148	1,338	2,336
January	10,591	1,637	429	411	445	4,001	1,349	2,316
March	10,794	1,669	377	434	446	4,049	1,477	2,312
April	10,444	1,612	379	341	450	3,814	1,592	2,256
May	11,492	1,748	344	344	429	4,520	1,631	2,476
June	11,530	1,743	311	241	430	4,635	1,716	2,424
July	11,202	1,699	341	440	452	4,143	1,773	2,554
August	11,470	1,619	352	441	465	4,340	1,871	2,382
September	11,549	1,607	398	482	479	4,301	1,860	2,432
October	11,696	1,633	409	455	505	4,223	1,908	2,563
November	11,753	1,561	446	457	493	4,410	1,926	2,460
December	12,005	1,618	384	456	482	4,511	2,013	2,511
Women, 16 years and over:								
January	4					4		
February	4					4		
March	4					4		
April	4					4		
May	4					4		
June	4					4		
July	4					4		
August	4					4		
September	4					4		
October	5					5		
November	4					4		
December	4					4		
Children, under 16 years:								
January	50					28		22
February	47					26		21
March	51					29		22
April	42					23		20
May	50					29		21
June	47					28		19
July	52					32	3	17
August	48					28	3	17
September	48					28	3	17
October	45					25	3	17
November	44					32	3	9
December	42					26	3	13

TABLE NO. 12. COPPER SMELTING AND REFINING, BY STATES AND TERRITORIES: 1899 -Continued.

	United States	Arizona	California	Colorado	Michigan	Montana	New Jersey	All Other States and Territories
Miscellaneous expenses:								
Total	\$1,522,325	\$266,548	\$90,026	\$11,517	\$33,685	\$556,852	\$290,425	\$23,344
Rent of works	\$92,900	.....	.....	.....	.....	\$25,101	\$1,500	\$6,400
Taxes, not including internal revenue	\$215,242	\$30,035	\$4,229	\$6,878	\$6,705	\$128,005	\$10,980	\$29,399
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	\$1,228,603	\$236,512	\$85,797	\$3,991	\$26,980	\$388,945	\$248,843	\$37,535
Contract work	\$45,380	.....	.....	\$678	.....	\$14,912	\$30,000	.....
Material used:								
Total cost	\$122,174,129	\$6,370,884	\$1,379,423	\$3,385,113	\$16,754,220	\$20,556,336	\$32,545,179	\$41,182,974
Ores:								
Tons	4,039,315	752,642	223,251	159,729	.....	2,442,636	3,766	457,291
Cost	\$25,190,522	\$3,426,054	\$778,452	\$3,070,825	.....	\$14,458,398	\$127,004	\$3,339,789
Matte purchased:								
Tons	48,182	1,413	20	.....	.....	2,795	29,778	14,176
Cost	\$10,513,431	\$130,385	\$3,625	.....	.....	\$611,834	\$6,706,875	\$3,000,162
Blister "mineral" or anodes purchased:								
Tons	284,620	.....	.....	.....	\$3,852	.....	72,967	127,301
Cost	\$72,401,654	.....	.....	.....	\$16,501,529	.....	\$22,796,439	\$33,103,636
Fuel	\$5,615,465	\$2,109,832	\$551,499	\$2,3621	\$127,480	\$1,342,396	\$460,396	\$79,741
Rent of power and heat	\$18,961	.....	\$360	.....	.....	\$18,076	.....	\$825
Mill supplies	\$917,249	\$294,196	\$9,942	\$25,138	\$5,270	\$334,047	\$62,783	\$215,903
All other materials	\$4,766,604	\$238,509	\$32,500	\$65,529	\$119,941	\$1,390,041	\$2,391,132	\$28,952
Freight	\$2,720,213	\$171,358	\$3,945	.....	.....	\$2,101,544	.....	\$144,666
Products:								
Aggregate value	\$165,131,670	\$17,286,517	\$4,508,259	\$3,193,034	\$17,340,041	\$36,387,063	\$38,365,131	\$47,351,625
Smelting:								
Total value	\$54,275,173	\$17,238,980	\$1,508,159	\$3,893,034	.....	\$22,269,979	\$6,900	\$7,687,921
Fine copper contents of blister or anodes:								
Pounds	197,056,734	75,127,116	84,001	.....	.....	112,775,861	2,930,000	6,139,757
Value	\$25,853,917	\$9,663,907	\$12,444	.....	.....	\$14,817,269	\$440,000	\$920,273
Fine copper contents of matte:								
Pounds	137,622,799	52,832,952	25,863,637	21,212,797	.....	21,492,199	.....	13,221,124
Value	\$17,511,130	\$6,861,515	\$3,834,490	\$1,993,791	.....	\$3,254,766	.....	\$1,626,568
Silver:								
Ounces, fine	8,866,472	711,313	427,315	728,131	.....	6,032,031	301,800	667,619
Value	\$5,020,960	\$411,016	\$227,035	\$428,493	.....	\$3,412,340	\$170,000	\$351,106
Gold:								
Ounces, fine	304,914	18,074	23,328	71,366	.....	45,781	3,453	138,882
Value	\$5,891,046	\$362,542	\$434,269	\$1,470,750	.....	\$85,613	\$69,000	\$2,767,911
Received for contract work	\$236,961	.....	\$280	.....	.....	\$282,464	.....	\$11,211

TABLE NO. 12—COPPER SMELTING AND REFINING, BY STATES AND TERRITORIES: 1899—Continued.

	United States	Arizona	California	Colorado	Michigan	Montana	New Jersey	All Other States and Territories*
Refining:								
Total value	\$1,0,856,494	\$47,537	.....	.....	\$17,340,041	\$14,117,084	\$37,686,131	\$41,665,704
Ingots, wire, bars, etc.:								
Pounds	62,595,113	.....	.....	.....	102,001,189	95,404,468	170,326,925	234,862,531
Value	\$94,061,667	.....	.....	.....	\$17,340,041	\$12,111,564	\$27,432,652	\$37,008,410
Blue Vitriol:								
Pounds	27,298,926	1,211,313	.....	.....	.....	.....	1,818,272	24,119,341
Value	\$1,225,745	\$47,537	.....	.....	.....	.....	\$91,413	\$1,086,795
Silver:								
Ounces fine	13,229,911	.....	.....	.....	.....	3,026,888	7,594,255	2,608,735
Value	\$7,790,995	.....	.....	.....	.....	\$1,714,278	\$4,536,720	\$15,997,777
Gold:								
Ounces fine	224,352	.....	.....	.....	.....	10,612	150,949	62,791
Value	\$4,556,850	.....	.....	.....	.....	\$212,242	\$3,688,788	\$1,255,829
All other products	\$3,221,250	.....	.....	.....	.....	.....	\$2,536,548	\$684,702
Received for contract work	\$3,452,855	.....	.....	.....	\$346,287	.....	\$1,035,654	\$2,070,914
Power:								
Number of establishments reporting...	47	9	3	3	3	7	7	15
Total horsepower, owned.	66,242	6,211	1,520	1,035	930	34,350	8,952	13,214
Engines:								
Steam:								
Number	396	58	12	15	15	177	31	88
Horsepower	48,126	5,285	1,112	825	870	20,200	8,320	11,444
Gas or gasoline:								
Number	8	6	1	.....	.....	.....	.....	1
Horsepower	337	326	3	.....	.....	.....	.....	8
Water wheels:								
Number	29	2	4	1	4	15	.....	3
Horsepower	9,467	120	335	120	60	8,750	.....	82
Electric motors:								
Number	212	28	.....	3	.....	68	58	55
Horsepower	4,612	480	.....	120	.....	1,700	632	1,480
Other power, horsepower	3,709	.....	.....	.....	.....	3,709	.....	.....
Establishments classified by number of persons employed, not including proprietors and firm members:								
Total number of establishments	47	9	3	3	3	7	7	15
5 to 20	1	.....	.....	.....	.....	.....	.....	1
21 to 50	8	2	2	.....	1	.....	.....	3
51 to 100	7	3	.....	1	1	.....	.....	2
101 to 250	15	.....	.....	1	2	1	4	7
251 to 500	8	3	1	1	.....	3	.....	.....
501 to 1,000	6	1	.....	.....	.....	1	2	2
Over 1,000	2	.....	.....	.....	.....	2	.....	.....

* Includes establishments distributed as follows: Connecticut, 2; Illinois, 1; Maryland, 1; Nevada, 1; New Mexico, 1; New York, 2; Ohio, 1; South Dakota, 1; Tennessee, 1; Utah, 2; Virginia, 1; Washington, 1.

MONTANA SAPPHIRES.

The report of Joseph Hyde Pratt on the occurrence and distribution of corundum in the United States has just been completed and sent to the printer by Director Wolcott of the United States Geological Survey. In this report Mr. Pratt, says that the only systematic mining that has been undertaken for sapphires is in Montana. Sapphires were first found in this State by miners who were washing the gravels of the bars on the Missouri

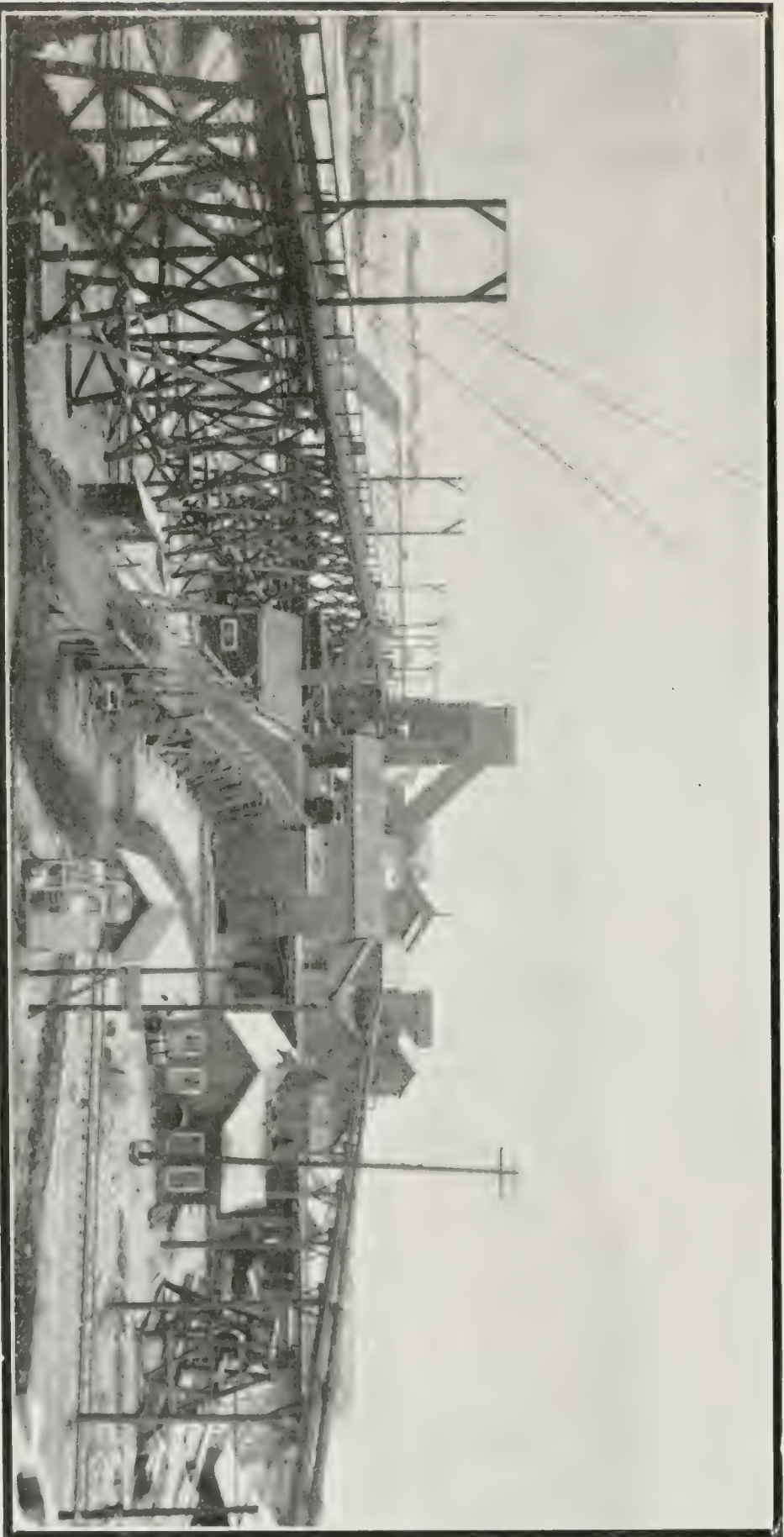


TUNNEL ENTRANCE TO YOGO SAPPHIRE MINES.

river east of Helena for gold. These were first described in 1873 by J. Lawrence Smith, but it was not until 1891 that actual mining was begun. During this year a number of companies were organized to work for sapphires.

These bars are located from 12 to 18 miles east and northeast of Helena and have been followed for a distance of about 12 miles, from Canyon Ferry down the river to American bar. At various intervals these bars have been worked for the sapphires from Emerald bar to American bar. A few sapphires have been found down the river as far as Beartooth, but sapphires have not been found in large quantities below American Bar.

Above Emerald bar there have been no sapphires found on any of the



MONTANA ORE PURCHASING COMPANY'S CONCENTRATOR

bars, but in the gravel of Maple gulch, less than a mile above, many sapphires have been found by miners who were washing the gravel for gold. No sapphires have been found in this gulch, but Kunz has noted the occurrence of sapphires that were found in a dike about six feet wide, cut through the green slate below the gravels. At French bar a dike was found about 50 feet above the river that had greenish sapphires scattered sparingly through it. The beds of gravel in which the sapphires occur are from 10 to 50 feet thick and rest for the most part upon slate, in bluffs that rise many feet above the river. At Emerald bar the beds are nearly 130 feet above the river and rest on granite rock.

Most of the mining has been done at Spokane and Eldorado bars. The Spokane bars were extensively mined a few years ago by an English company which also controlled French, Dana, and Eldorado bars. The company afterward became an American one, with Frank Spratt of Helena as manager. Metropolitan bar is now worked by Robin Bird, Charles Johnson and John Durrant of Helena. Henry Crittenden of Canyon Ferry, controls the deposits at Emerald bar.

Most of the gems obtained from all the bars during the last year have been put on the market through the Helena Lapidary Company.

As mining investments these sapphire deposits have not thus far been financially successful, partly on account of the heavy capitalization of the companies who have bought the mines and partly on account of the color of the stones. They are for the most part a pale greenish or a greenish yellow color, and do not command a very high price in the market. Occasionally pink and yellow ones have been found that have cut good gems. Stones approaching a red or blue color are, however, extremely rare. The largest crystal was found on Eldorado bar. It was nearly an inch long and an eighth of an inch in diameter. Sapphires have also been found at Rock creek, Cottonwood creek and Yogo gulch. From these sapphire deposits stones of deeper colors have been obtained, those from Rock and Cottonwood creeks being of all colors from red to blue and those from Yogo gulch being all blue. The Rock creek sapphires are found about 30 miles west of Anaconda. They have been extensively worked by Mr. Knuth of Helena and William Moffit of Philipsburg. Altogether about 200,000 carats of rough sapphires were obtained, of which about 12,000 carats were fit for cutting. The prevailing colors of these sapphires are much deeper and they are much more varied than those found on the Missouri river. The Rock creek sapphires are coming to be highly prized by many who are acquainted with them. It can be confidently predicted that these sapphires will become important in the jewelry world.

The Cottonwood creek deposits are about 10 miles east of Deer Lodge. The sapphires here have been taken out by Frank Cobalt of Helena. They are similar in character to those of Rock creek, and the report says: "Future development at this locality may show these deposits to be of considerable importance and extent."

A recent special report of the United States Geological Survey says of the

YOGO SAPPHIRE MINES.

"The Yoko sapphire mines, which are today the most valuable gem mines in the country, are situated in Fergus county, Montana, 13 miles west of the town of Utica. The locality is not accessible by railroad, but can be reached by wagon road from Utica, from which town a stage line runs daily to the railroad at Great Falls. There is also a short cut over the mountains by horseback trail to Neihart, the termination of the Belt Mountain branch of the Great Northern railway.



OPEN CUT IN THE SAPPHIRE LEDGE AT YOGO.

"These mines are an illustration of the good luck which sometimes occurs in mining. In 1895 a placer company was organized to work the gold-bearing gravels found in pockets upon the limestone bench land lying east of the Yogo fork of the Judith river. A ditch costing \$38,000 was built and the waters of Yogo creek were carried upon the bench land with a head of 300 or 400 feet. The first season's work demonstrated that the gravels would not pay as gold placers, as a clean-up of but \$700 was made as the result of the entire season's work. The sluice boxes, however, contained a large number of blue stones, which were identified in November, 1895, as sapphires.

"A cigar box full of the gems collected at this time is said to have been sold to Tiffany & Company for \$3,700. Preparations were immediately made

to work the gravels for the sapphires, which seemingly occurred in great abundance in certain parts of the field. It was believed that the gems, together with the gold, came from Yogo gulch, and that the gravels represented an old high channel of that creek. Their local derivation was discovered by John Ettien, a settler in the neighboring valley of the Judith river, in February, 1896. While prospecting the ground above the placer he noticed a fissure in the limestone, whose soft filling resembled the outcrop of a vein. Two claims were located on it and some of the dirt was taken to the nearest stream and washed. The blue sapphires in the earth were noticed, but it was not until they were shown to the placer workers that their value was known. The importance of this discovery was recognized by Mr. Hoover, one of the owners of the placers, and he and his partners at once located the sapphire lead. It is now known that the gems occur in a dike of trap rock cutting white and gray limestone. This dike has now been traced for a distance of five miles from the meadows of the Judith river westward to the canyon of Yogo creek. The entire known extent of the dike has been located as a lode and a large number of claims have already been patented.

"The mines are situated in the midst of a broad and open basin inclosed on three sides by the Little Belt Mountains, whose wooded slopes show white limestone outcrops that look like snow banks. To the east, high foothill ridges shut in the basin from the open plains country beyond. The Judith river flows through the center of the basin, its three forks uniting at the base of the mountain slopes to the west. The most northerly fork is Yogo creek and from it the mines take their name. The claims are located on the bare bench land lying north of the main stream and east of Yogo creek. The surface has a general easterly slope, having a descent of 800 feet from the brink of the Yogo canyon to the meadow land of the Judith river.

"Several dry drainage ways traverse the sapphire basin, cutting gulches before they are lost on the alluvial bottom lands.

"In a general view the sapphire locality shows rolling hills whose summits and slopes are formed by the bare and white surface of limestone. The intervening gullies are well grassed, and the gentle slopes show mat-like growths of ground cedar. Occasional small groves of stunted pine are seen in a few places, but the general lack of vegetation is in marked contrast to the wooded mountains near by.

"The geologic structure of the basin consists of a broad basin-like fold, opening eastward. It is a synclinal basin, lying between the sharp uplifts on the north and south. While the general structure is thus quite simple, the massive limestones show many minor undulations, and it is largely to them that the present relief of the surface is due, the soft, red earths that overlay the limestone having been carried off from the greater part of the district. As already stated, the gems are found in a dike of igneous rock cutting the limestone. This dike is recognizable on the surface only by a slight depression, a foot or so deep, emphasized by grass and herbage where it crosses the bare limestone slopes. In the hollows and gulches the outcrop is recognizable only by the line of gopher and badger holes which

mark its extent. No solid outcrops of the dike rock occur, as it alters on weathering to a soft clayey material. This is why its course is marked by gopher heapings, since the adjacent limestone is too hard and undecomposed for these animals to burrow into. These holes, indeed, proved the means of locating the dike when the claims were staked, and many of the finest stones yet obtained were picked up from the heapings made by these animals.

"The dike has a general southerly trend. It is from three to six feet wide, and, so far as shown by the workings, is vertical. It has been traced east and west from the meadow lands of the Judith to the walls of Yogo canyon, where it apparently ends, as it is not seen in the limestone walls of that canyon, but a few yards west of the crest. It has been found west of the creek bottom, however, at a lower elevation, and, as shown later, it is not seen in the exposure because it did not break quite so far through the limestones at this point. The dike walls are rough, but not especially irregular; they show the bedded limestones slightly indurated by the intrusion. The dike material is somewhat variable in appearance. Near the surface it consists of a coarse breccia of limestone and shale fragments cemented by the igneous rocks. Where the upward termination of the dike is seen, at the westernmost workings, the top part of the dike is a blunt wedge and the material consists chiefly of these fragments. In the main workings, two miles farther east and several hundred feet lower in elevation, the excavations show a similar breccia at the surface, but the size and number of the fragments decrease with the depth. This is believed to be the fragmental material from the fissure walls, which has been floated upward as the molten rock rose in the fissure, like chips on the surface of a stream of water.

"The workings were, in 1897, entirely in altered rock, the shaft being at that time only 60 feet deep. At this depth it had passed out of the zone of surface alteration, and the ochereous, yellow clay was replaced by a blue clay which reminds one very much of the description given the Kimberly diamond matrix. Throughout this clay there are boulders of the unaltered rock, with kernels of solid material, which have been broken open and furnish specimens for petrographic description. In the shaft the entire width is 11.4 feet from wall to wall. Of this, 3.7 feet on the south wall was of solid minette, checked with calcite seams, but otherwise comparatively fresh and unaltered. The clay does not always bear the same relation to the walls, but jumps across from one side to the other. In the workings it is at once seen that the upper part of the dike is largely a breccia—that is, it consists of a mixture of dike material and limestone fragments. It appears to be somewhat near the apex of the dike. The questions naturally arise, how far the relative abundance of these limestone fragments have influenced the formation of the sapphires, and whether the sapphires will continue in depth or not. For this reason a very careful examination was made of the shaft and of the blue clay which was seen there.

"The writer was unable to find any sapphires in the blue clay itself, but was assured that when washed, the blue clay yielded a fair proportion of the gems. There seems reason to believe that this blue clay will require a special

treatment, inasmuch as it is very tenacious and does not yield readily to ordinary treatment by washing. In all probability it will have to be handled as the blue clay of Kimberly is handled for the extraction of diamonds. The gems in this blue clay are said to be much finer than those in the more altered material. This, one can readily believe, because the sapphires in the altered rock are so checked and fissured that even when found in place they split up into chips of no value for cutting. In the blue clay the gems would not have been subjected to the strains and processes incident to the decomposition and expansion of the rock, and, therefore, should yield a much larger proportion of cuttable stones.

"At the present, the greatest amount of material is derived from an open cut, 400 or 500 feet in length, upon the highest part of the claims. Three windlasses are employed, and men are at work with pick and shovel, digging the soft, yellow earth, and throwing it into shallow tubs, which are hauled to the surface, where the earth is thrown into ordinary dump carts. It is then hauled about a quarter of a mile to the ditch and dumped directly into sluice boxes. In the sluices the harder boulders and balls of blue clay are carried through the riffles and accumulate upon the tailing dumps. Probably not over 33 per cent of the gems are recovered in this first washing. By exposure to the atmosphere, and the frequent freezing and thawing which takes place in this frosty atmosphere, the blue clay slacks and disintegrates, so that the material can be washed over and a further extraction of gems takes place. At the time of the writer's visit some 20 loads, each approximating a square yard of earth, gave between 1,200 and 1,500 carats of cuttable stones. The value of the stones in London market is \$6 a carat for the first quality, \$1.25 for the second, and 25 cents a carat for the gleanings. The largest stones found weigh, when cut, 4 to 5 carats, and are then valued at \$75 a carat.

"In sluicing the earth the process followed is similar to that of washing gold-bearing gravels, but no mercury is used. The gems drop between the riffles and are obtained at the close of each day's work by turning off the water and lifting the racks. This material from the riffle is then sifted and panned by hand to get rid of valueless materials. The result is a concentration of the sapphires, together with grains of pyrite, from which the gems must be picked by hand. This pyrite is the only other mineral found with the gems. It has been assayed for the writer and found to contain a little silver, copper, and nickel, but no gold. The pyrite is in moss-like aggregates and not in well-shaped crystals. The clay contained a few hexagonal crystals, which had the form of corundum, but consisted of some decomposition product and showed no trace of original mineral. The shaft has been sunk to a depth of 300 feet, and considerable masses of corundum are said to have been found at that depth.

"As already stated, in the upper part of the dike the rock is largely altered to a yellowish clay in which only the fragments of sedimentary rock are recognizable. At depths of 20 to 40 feet below the surface boulders of igneous rock are found. They are clearly nucleal masses not yet decomposed

by surface waters. In some places considerable masses of the solid dike rock are also found, and every gradation may be observed, from the tough and resistant dark-gray dike rock to the soft yellow clay into which it finally decomposes.

"The freshest material has been carefully studied and proves to be a lamprohane rock. In the hand specimen it is dark gray, has an uneven, rough fracture, and is evidently a tough and heavy trap rock. The rock shows numerous angular inclusions of white or pale green color, which vary in size from those of microscopic dimensions to masses a foot or more across. The large inclusions consist chiefly of either quartz or crystalline calcite, surrounded by a rim of pale green pyroxene of small but variable width. Some of the smaller inclusions consist entirely of this green pyroxene and it is recognizable in the calcite centers of the larger pieces.

"The dike rock itself is very dense, dark colored, and glistens with the light reflected by innumerable flakes of biotite, of which the rock is seemingly composed. Pyroxene is recognizable to the eye. A few scattered tablets of brown mica—the largest seen a quarter of an inch across—are the only phenocrysts. Under the microscope the rock is seen to consist of biotite and pyroxene in closely crowded masses. There is no feldspar present, but a small amount of interstitial kaolin-like material occurs. The rock is most like a mica-pyroxene-analcite-basalt.

"The sapphires occur embedded in this rock in well-formed crystals and in rounded masses one-twentieth to three-quarters of an inch across. They were found in the freshest unaltered rock obtained, as well as in the altered decomposed material. They show no connection with the included fragments and are always distinct and sharply defined. Their crystalline form is fully discussed by Pratt, a summary of his work being given in Professor Pirsson's report.

"The occurrence of the sapphires shows quite conclusively that they were formed in the dike rock itself. Their origin is believed to be the result of the action of the molten igneous rock upon fragments of clay, shale, or impure limestone, taken up by the former in its ascent, as suggested by Pirsson. This implies the complete assimilation and digestion of such material in the igneous rock. It is apparent from a study of the sapphires themselves that they crystallized out of the rock, but it is also evident that partial reabsorption took place before final consolidation, since many of the sapphires show deeply corroded surfaces; others are rounded masses whose crystalline outline is nearly effaced, while many of them are surrounded by a blackish crust. If the molten rock could dissolve the sapphires at this stage, it is certain it could dissolve clay shale as well. The dike undoubtedly extends a considerable distance in depth. The limestones are 1,000 feet thick in this vicinity and rest upon nearly a thousand feet of Cambrian shale. The Belt formation is believed to be absent, but the Cambrian beds contain almost every possible variety of calcareous, silicious, and argillaceous rocks. It is remarkable, however, that, though sapphires are found throughout the entire extent of this dike, they do not occur in the parallel dike of nearly simi-

lar rock that cuts the limestone 600 feet north of the sapphire claims, nor have gems been found in the augite minettes that occur as dikes and sheets in the shales of the quadrant formation southeast of the mines, along the border of the Judith river bottom lands.

"A parallel dike about 600 feet north of the sapphire dike, weathers to a sandy, micaceous material that probably represents the outcrop of a



HYDRAULIC MINNIG FOR SAPPHIRES, YOGO.

minette dike cutting through the limestone. A few kernels of partly altered rock were found where prospecting had been done on the dike. The rock and its debris show no sapphires, although many cart loads of the dirt have been washed from different points along the outcrop. It seems probable, however, that this dike is the source of the gold found in the placers, as the colors can be traced up the gulches to the outcrop of the dike and never occur beyond it.

Methods of Working the Mines.

The methods of extracting the sapphires from the magma is much similar to that used by placer miners in sluicing for gold. The sluice boxes are fitted with Hungarian riffles, as in placer mining, but it is necessary to exercise more care in setting them, as the specific gravity of the sapphire is much less than that of gold, and with the boxes set at too great a "pitch" they would pass over the riffles and be lost. When first attacked the magma

is passed over a "grizzly" (screen) and the finer parts pass at once into the sluices. The coarser, harder material is thrown into the dump, where, after is passed over a "grizzly" (screen) and the finer parts pass at once into the sluices. The process of disintegration occupies from one month to one year, according to the hardness and tenacity of the magma. Superintendent Sweeney of the American Company assists the elements in the disintegration of his dumps by turning a flow of water on them occasionally, and by this means the hardest of the vein matter is ready to pass through the sluices in two months.

For cleaning up an ordinary rocker is used, with three screens of as many sizes, through which the "pay dirt" is passed. When the "pay dirt" has been worked down as closely as possible in the rocker it is panned in one of the finer screens, dried and the stones picked by hand from the small amount of gravel remaining. All the stones are saved, the larger perfect ones being valuable as gems; the smaller ones being used as watch jewels and in other fine mechanical work; the imperfect ones are ground and mixed with diamond dust and used in gem-cutting and for polishing purposes, when it is known as emery.

The stones of the Yogo vein vary in size from the smallest to four or five carats, and as gems they equal in value the best products of the mines of Ceylon and Burmah. The largest stone yet found in the American Gem Company's mines was taken from the Fourth of July claim, and weighed eight karats, and taken from the New Syndicate mines weighed a little more than nine karats.

The stones are very equally distributed throughout the vein, but are less broken and somewhat better formed in the deeper workings, although some of the most valuable stones yet found were from the surface. The sapphire color is blue and the shade known as corn-flower blue is the most highly prized. Occasionally stones very nearly approaching the ruby are found in the Yogo vein, but they are usually imperfect and worthless as gems.

The gems produced in the New Syndicate mines are sent to the lapidaries in New York and London for cutting, while those from the American Gem Company mines are cut by lapidaries in Helena.

Production of Sapphires at Yogo.

The New Mines Syndicate at Yogo produced last year about 60,000 karats and the American Gem Mining Company about 50,000 karats. For 1902 the estimated output in this district is 200,000 karats, besides thousands of ounces which will be used for mechanical purposes. The American Gem Mining Company has a shop in Helena where 15 men are employed cutting the stones, and it is confidently asserted that much finer work is done here than is done on stones sent to be cut in London. Altogether the output of precious stones in Montana exceeds the production of all the rest of the United States, and forms a very interesting addition to our industries.



MONTANA ORE PURCHASING COMPANY'S SMELTER, BUTTE

CYANIDING IN MONTANA.

The simplest recovery of gold is, as in placer mining, where the waste is washed away and the gold caught by taking advantage of its specific



READY FOR THE FIRST RUN OF ORE—WHISKY GULCH MILL.

gravity. The same principle governs the recovery of gold from quartz, where the gold is said to be free. The ore is crushed by stamps to free the gold from the quartz which encloses it and the pulverized quartz is washed off, leaving the gold behind. Mercury is used in both cases to catch and hold the finer particles. In front of the stamp battery or other crushing appliance, screens are placed to hold the ore back until it is crushed to the degree of fineness found necessary, for the values in some ores are easily obtained by coarse crushing, while very fine crushing is necessary with others

before a goodly percentage of the values can be obtained by the simple process called amalgamation.

All the earlier gold saving from quartz was by amalgamation, and for a long time it was supposed that by this method all was saved that could be saved. But it was found that quite a proportion of the values in free milling ores escaped with the pulp that was washed away. Some of these values were found associated with other metals and the inventive mill man devel-



LEACHING TANKS AT KENDALL MILL, KENDALL.

oped concentration—a method based on the same principle as amalgamation, the saving of values by taking advantage of their specific gravity. Still values escaped. In some ores as much as 50 per cent remained in the pulp after the best work by amalgamation and concentration, and some ores were found where practically no values could be extracted by these processes.

To meet this exigency, cyanidation was developed. Though cyanide had long been known as a solvent for gold, it was not until MacArthur and

Forrest brothers, of Glasgow, Scotland, made practical application of the fact, that gold was recovered from ores by its aid. The process was first introduced at Ravenswood, Australia, in 1889, and immediately afterwards near Johannesburg, South Africa. As with all new processes, it was at first met with distrust, but this soon gave way under the gratifying fact that considerable quantities of gold were profitably extracted from material previously run to waste.

The process was first introduced into Montana in 1893 by Robert B. and Frank Turner at the Revenue mine in Madison county. Statistics of production by cyanide in the State have been kept since 1896 and are as follows:

YEAR	Gold Coinage Value	Per Cent of Total Production	Silver Coinage Value	Per Cent of Total Production	Total for Year	Increase Over Pre- vious Year
1897	\$206,576.06	4.60	\$43,878.79	.20	\$250,454.85	.....
1898	397,626.46	7.60	100,357.47	.52	498,493.93	\$248,039.08
1899	790,647.71	16.37	126,299.58	.60	916,947.29	418,453.36
1900	887,311.57	18.73	141,514.58	.71	1,028,826.15	111,878.86
1901	1,178,574.84	24.54	163,545.56	.89	1,342,120.40	313,294.25

These figures show that in five years the amount of gold recovered by the use of cyanide has increased from less than 5 per cent of the total amount won from ores in this State to 25 per cent—certainly a most remarkable and creditable record. And the end is not yet.

What is cyanidation? How does cyanide work? Is the process an expensive one? These are questions naturally asked by persons unfamiliar with it.

Cyanidation is a liquid process. It accomplishes the desired work by dissolving the gold. If we take a piece of sugar and place it in a tumbler of water it dissolves. We may examine the fluid under a microscope and yet find no trace of the sugar. What has become of it? It has been taken into solution. Just what this is has not been fully determined, but the most generally accepted theory is that “the particles of a solid when placed in a liquid in which it is soluble, keep getting smaller and smaller, until they are separated into their molecules.”

Cyanide is a combination of the gas, cyanogen, with a metallic base, the most important commercial product being that with which cyanogen is combined with potassium, making potassium-cyanide, a crystalline solid resembling concentrated lye in appearance. A few pounds of this solid added to a ton of water makes a fluid which has the power to dissolve gold and hold it in solution. The gold is taken out of the solution by precipitation, generally by the use of zinc shavings or zinc dust; the zinc is then removed by the use of acid or heat and the gold is reduced to metallic form by melting.

Successful cyaniding comes from an intelligent adaptation of the process to the ore to be treated. An appreciation of the need of different methods can best be made plain by a description of the systems in use in differ-

ent plants in this State. Thus some of the ores of Fergus county are most admirably adapted to the simplest form of cyaniding. They are crushed to pass a quarter of an inch slotted screen and are then treated by percolation. In other words, the particles of ore, most of which after being crushed are about the size of kernels of wheat, are soaked in cyanide solution of the desired strength, say four pounds of cyanide to the ton, for 8 to 12 hours. The solution is drawn off and run through the zinc boxes, where the gold is precipitated from it on to the zinc shavings. A weaker solution is passed through the crushed ore for two or three days, and then the ore is washed with clear water, the successive washings removing from the ore such gold as has been dissolved. After the gold has been taken from the solutions, they have cyanide added to them to bring them up to the desired strength, when they are ready to use over again.

Some of the ores in Madison county require fine crushing before their values are accessible to the dissolving fluid, and they make many slimes, so that after they are crushed the ore is a pasty mass through which the fluid cannot be passed. Percolation being out of the question, these ores are treated by agitation. In other words, the fluid is not passed through the crushed ore, but the ore may be said to be washed in the fluid. The ore is stirred by mechanical means in a vat in which cyanide solution is placed until such gold as can be dissolved is in a fluid state, tests being made to determine the time of treatment needed for each particular ore. By the aid of lime the fluid is then clarified, the slimes settling to the bottom of the vat. The clear fluid containing the dissolved gold is then drawn off near the top instead of at the bottom, as in percolation.

These are the two extremes. There are various modifications, adapted to the peculiarities of the different ores.

Thus, at Mr. Mueller's mill, near Rochester, the ore is crushed to about 20 mesh, when it is cyanided and then concentrated. The concentration is to recover galena with which some of the gold is combined in such a way that the cyanide cannot affect it.

At the Clark mill, in the same district, the ore was crushed to about 20 mesh and cyanided by percolation, then recrushed to 100 mesh or finer, and the remaining values removed by amalgamation and concentration.

At the Belmont mill, Marysville, such gold as could be recovered by amalgamation was taken out in the usual way, when the pulp from the battery flowed to tie boxes where it was settled, the slimes being allowed to run to waste. From these boxes the pulp was shoveled into large vats, where it was treated by percolation.

At the Montana Co.'s mill, near Sheridan, the pulp, after leaving the plates, was run direct to agitators, where it was all saved and treated by agitation.

The necessity of using these different systems can best be made plain by stating that the ideal ores of Fergus county need to be crushed to but one-quarter inch mesh, which makes 256 particles to the cubic inch. The ores of Madison county are generally crushed to 45 mesh, which means 4-

100,625 particles to the cubic inch. To understand why this difference in crushing is necessary we have but to notice the difference in the character of the ores themselves. Thus the ores of Fergus county above mentioned are micro-crystalline, in other words, are composed of minute particles, such as form sandstone and quartzite, giving them a granular appearance, though many of the constituent particles are individually so minute that they cannot be distinguished from each other by the naked eye. Then they run low in silica, containing seldom as high as 20 per cent, so they are easily crushed and are more permeable than silicious ores generally. It is presumed that the gold enclosed in the ores is micro-crystalline, partaking of the character of the gangue—so fine that it cannot be detected by the naked eye, or saved by amalgamation. The cyanide solution is enabled to penetrate the interstices between the minute particles of the ore and dissolve out the atoms of gold locked in their embrace. Thus an extraction of over 90 per cent can be secured from ores assaying \$10 per ton.

How different this from ores in the same formation—limestone—in other portions of the State. Many of these ores, especially those cyanided in Madison county, are amorphous. This means that instead of being composed of minute particles, the ores are of a solid, uniform body like glass. Even with fine crushing, perfect extraction is not possible under ordinary conditions—an extraction of 50 per cent may be made by amalgamation, values of from \$4 to \$12 will then remain in the tailings, and from these an extraction of 65 to 70 per cent is made by cyanidation. With ores going \$20 per ton, this still leaves \$3 to \$3.50 in the tailings. There is a way in which a more perfect extraction can be secured from ores of this character, but it has not been put into practice. Tests made in the laboratory show that an extraction of 96 per cent can be obtained from \$10 ore by first giving it a preliminary roast. This roast is not, as many would suppose, to free the ore from base substances, though that is sometimes necessary, but to so crack the gangue as to make the fine particles of gold accessible. It is believed that the action of heat is such as to curl the particles of metal enclosed in the impervious matrix so that the rock breaks at the places where it contains the gold. Whether this idea is the correct one or not, it is known that a preliminary roast of an amorphous, jaspery ore is all that is needed to make it part with its precious contents when they cannot be secured in any other way.

The largest mill in the State treating ores by cyanidation direct, is the Kendall, in the town of that name in the North Moccasin mountains, in Fergus county, it having a capacity of 350 tons a day. The next largest is the Barnes-King, in the same neighborhood, having a capacity of 220 tons a day. The third largest is the mill at Gilt Edge, with capacity of 140 tons a day. The largest plant in Lewis and Clarke county is a tailings plant, treating the tailings from the Drumlummon mill, at Marysville. Its capacity is 400 tons a day. A new plant, at Empire, just starting, is expected to have a daily capacity of 500 tons. The largest plant in Madison county is the one at Iron Rod. It is a slime plant and has vats 18 feet in diameter in

which 50 tons of slimes may be treated at a charge. This was the largest charge of slimes treated at once in the State, but the Montana Company, limited, at Marysville, fitted two of its percolation vats with agitators this summer; and these vats, being 30 feet in diameter, handle successfully 140 tons of slimes at a charge.

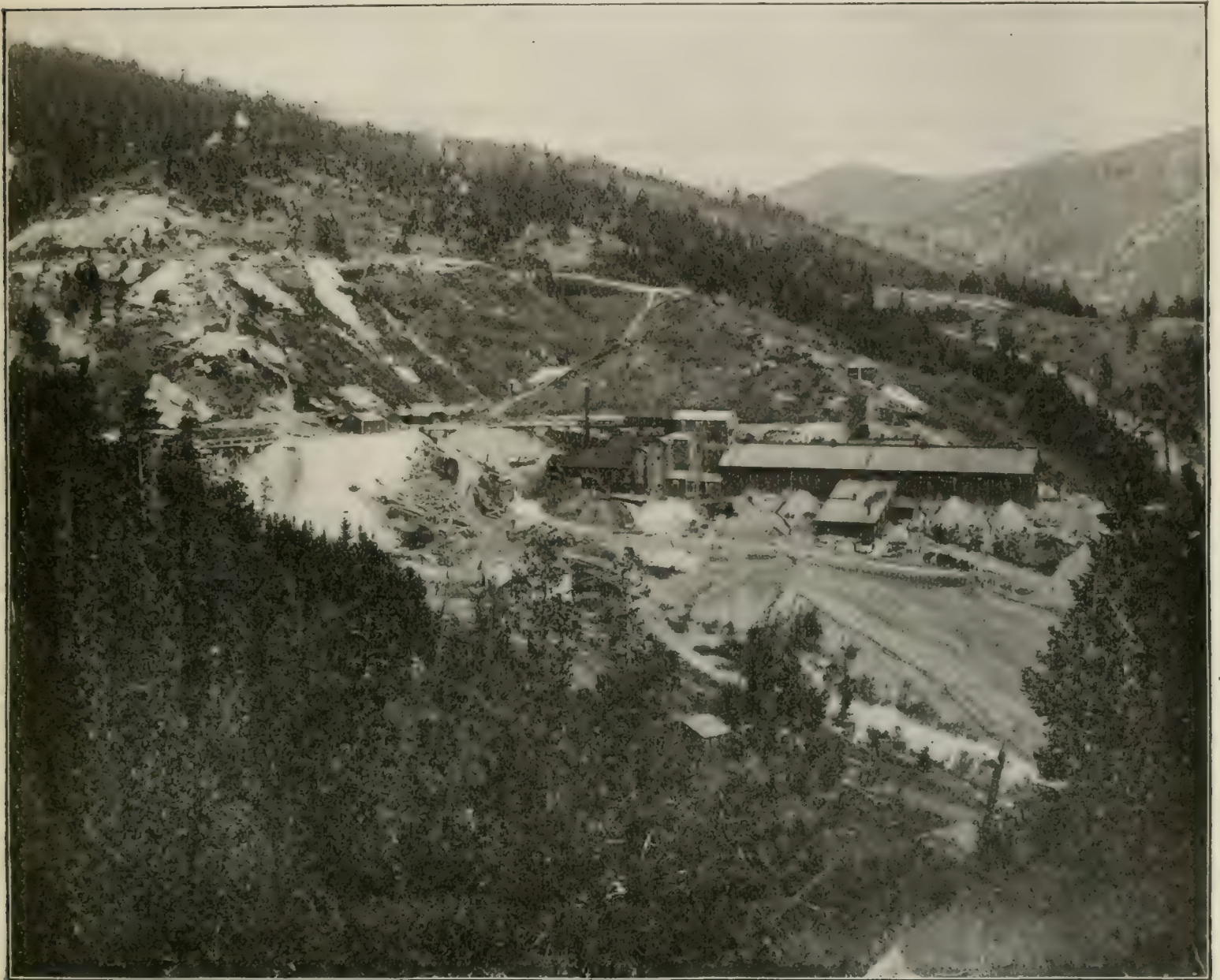
It is obvious that the cost of cyaniding will vary greatly under the differing conditions referred to. At Kendall, where the mining is a quarrying proposition, where the ore needs coarse crushing only, and where the consumption of cyanide is low, the labor and supplies for mining runs from 30 to 32 cents, milling labor and supplies from 40 to 45 cents per ton; refining, assaying and power about eight cents per ton more, making the total cost of mining and cyaniding but 80 to 85 cents per ton. The tailings at Marysville are cyanided at a cost of but \$1 a ton. Other tailings have been profitably cyanided in the State where the cost for cyanide alone exceeded this figure. As no two mining propositions are exactly the same, it is not possible to state even an approximate cost for cyaniding an ore without taking conditions into account. Ore may be cyanided at as low a cost as 80 cents per ton, as at Kendall, or, under management elsewhere just as intelligent and economical, it may cost several dollars a ton.

For the actual recovery of the gold in an ore but a small amount of cyanide is needed. Where there is a considerable consumption of cyanide it is caused by base substances in the ore. The popular opinion that a small amount of copper in an ore precludes its being successfully cyanided is largely erroneous. Unless the amount of copper which is dissolved by the cyaniding solution is such as to necessitate the use of a greater amount of cyanide than can be afforded to make the venture profitable, copper is not an interfering element; for it is readily precipitated from the solution along with the gold. Where the amount of copper is considerable and susceptible to the action of a solvent, it is possible to remove it by an acid or neutral solution from which it may be precipitated by iron, making "copper cement," before cyanidation is attempted.

The element in Montana ores which operates to greatest disadvantage in cyaniding is the presence of a form of iron which cyanide dissolves and holds in solution. Authorities tell us that in dissolving one pound of this iron seven pounds of cyanide are required. Not only is this expense for nothing, but it is next to impossible to free the solution from the iron; so it accumulates and interferes with the work in many ways. There are piles of accumulated tailings in Madison, Jefferson, Beaverhead, Silver Bow, Deer Lodge, Granite and Lewis and Clarke counties which it will pay well to treat when some one finds an economical way to overcome the deleterious influences of this iron in the work of cyanidation.

Lewis and Clarke county takes the lead in Montana in the production of gold by cyanide, Fergus county coming second and Madison county third. The production of other sections has thus far been of minor importance. Lewis and Clarke county has always been the banner gold producing county of the State, and holds the lead also in gold produced by the aid of cyanide

on account of the treatment of large quantities of accumulated tailings. Prospects are that these will nearly all be treated inside of the next two years. Then Fergus county may take first place in the production of cyanide bullion. In fact, in the recovery of gold from ores direct, by cyanide, she already holds it, and there is every indication that her production this year will make her outrank every other portion of the State.



CYANIDE PLANT OF THE GREAT NORTHERN MINING AND DEVELOPMENT CO.

The increased production of the past year came principally from a district unknown a few years ago—the North Moccasin mountains—and it is that district which will swell the product this year very materially. This is encouragement for the belief that even in sections thoroughly prospected other gold producing properties may yet be found. There are gold properties in the Little Rockies, Choteau county, which are to have a 100-ton plant this year. A large plant is being built for the Bear Gulch company at Jardine, in Park county. Flathead county is a new field in which there are said to be opportunities awaiting the advent of capital and skill. In the

older settled counties, particularly Lewis and Clarke and Madison, there are opportunities not only for new mines, but more especially in connection with some of the old ones. Many of these were worked years ago and were left with ore in sight which it would not pay to treat then, but which would be good ore with the increased percentage of extraction that could be made at the present time. Montana has suffered in the past from milling operations having been started on properties before they were ready for such, and what she needs now is not men who will come into a district, build a fine mill and then look about for a mine, but men who will put money into a mine until they have hundreds of thousands to millions of dollars worth of ore in sight and then put up a mill adapted to the ore. The trouble is that capitalists generally are on the lookout for a developed property. Such a thing is not on the market in this State. The opportunities are in taking hold of promising prospects and what are supposed to be worked-out properties and developing them into mines. This means the exercise of intelligence and courage, backed by capital. For such the field is inviting. But as capital is generally credited with being timid, the development of the country depends largely on those having the courage and but limited capital. Under these circumstances the growth of cyaniding in the State may not be by wonderfully rapid strides; but the record of the past is assurance that it will be steady and permanent.



VIEW OF THE EAST PACIFIC MINE, WINSTON—TAKEN FROM NO. 3 TUNNEL.
[Large building to the left is the Bunk House. Center building is the Boarding House. Building to the extreme right is the Office and Store.]



SPECTATOR MINE, BUTTE.

TWO INTERESTING CONTRIBUTIONS.

For the description of the new smelter of the Anaconda Copper Mining Company, located at Anaconda, the Bureau gratefully acknowledges its obligation to Mr. C. H. Repath, chief engineer of that company, who was in direct charge of all the details of this mammoth undertaking. Also, for the paper following which addresses itself to the subject of "The Mechanical Engineer as a Factor in Modern Mining, Milling and Smelting." The first is a paper read before the Montana Association of Civil Engineers, and the latter was read before the International Mining Congress at Butte, September 3, 1902. While both have received publicity through the press, it is believed that an authoritative reproduction of descriptive and somewhat of historical fact, as relates to these subjects, is justified upon the ground of the desirability of an official record of our industrial progress, deserving of more than passing notice by the people of Montana, and of special value to those outside of the State who seek material from which to form an estimate of our industrial growth and standing. The new reduction works are the largest in the United States, and, perhaps, in the world. The progress of the mechanical appliances; the triumphs of engineering skill; the means of transportation, concentration and smelting of ore, both formerly and at present; instances recording the origin and evolution of invention and the particular mining and smelting companies which have brought about the successive innovations—all these from the pen of one so familiar with and skilled in mine, mill and smelting engineering as is Mr. Repath, makes the record worthy of valuable space. The contributions follow:

THE NEW REDUCTION WORKS.

For some years there had been more or less planning relative to building a new reduction works on the hill side near East Anaconda; plans had been made and the site purchased for the purpose of building a works for the Washoe Copper Company.

The old works of the Anaconda Copper Mining Company were built a number of years ago and, though they were the largest and best of the kind at the time they were built, still improved methods and appliances that had been perfected since the works were first built, together with deterioration owing to constant usage and wear and tear, made it necessary to remodel them to a greater or less extent. The cost of remodeling the old works and adapting them to new conditions influenced the management to reconsider the plans that had been made for the new Washoe smelter, keeping the idea in view of building a plant that would have sufficient capacity to treat all the ore that was being treated in the old works.

Early in the year 1900, Mr. Frank Klepetko was made manager of the reduction works, and he, in conjunction with Mr. Daly, the president of the Anaconda Copper Mining Company, determined to outline plans for a re-

duction works that would eventually have capacity sufficient to treat five thousands tons of ore per day. Preliminary plans were made, the probable cost estimated, and in April of that year, the president and executive board of the Anaconda Copper Mining Company authorized the building of the new reduction works.

The work was of such magnitude and the expenditure of money would be so great that it was found necessary to employ a large number of engineers and draughtsmen to make the final plans for machinery and buildings, and the engineering staff of from twenty to twenty-five men have been constantly employed in designing the buildings and appliances for doing the work. An extension was built to the general office building in order to provide office quarters for the men and soon the work was fairly launched.

Careful surveys of the whole hillside were made, together with surveys for the railway lines necessary to reach the works; also for the location of a flume that would carry water from Warm Springs creek to the site of the new works.

The conception of the idea was worked out by Mr. Klepetko, as manager, and the men whom he employed. The site of the works is on an imposing hillside near East Anaconda, and together with the necessary tracks, storage bins, etc., occupy over three hundred acres. Starting from a point near East Anaconda the railroad goes east and south, following the line of the western bluffs of Mill creek, going up Mill creek for four miles, then making a loop, and still climbing, trails back upon itself and travels northward and westward for three miles more until it reaches the highest point in the works, which is the top of the concentrator bins. It was necessary to make this long detour in order to reach the height by easy grades. The maximum grade of the railroad is 1.1 feet in one hundred feet, or something like 55 feet per mile. The top of the ore bins at the concentrator is approximately 350 feet above the level of the valley.

From a point about three miles up Mill creek valley there is another railway spur going into the works at a lower level. This is known as the blast furnace bins line. It is about a mile and a half long, where it branches from the main line until it reaches its end near the power house. There is also another spur from the Mill creek line, going into the converter plant, which will take out the finished product of the works. This spur is about three-quarters of a mile long, from where it branches off the main line going up the Mill creek valley.

One of the first things done in the construction of the new plant was the building of a temporary railway line from the main line of the Butte, Anaconda & Pacific railway up to the site of the works. Nearly three miles of temporary tracks were laid in and around the site of the works for construction purposes only. It was also necessary to build a wagon road to the site. Work began on the construction of this temporary railway line and the road leading to the works June 18, 1900. As progress was made the force was increased, until nearly nine hundred men were constantly employed.

The contract for the excavation and masonry was let to Messrs. Toole

& Twohy early in June, and they immediately started a large force into action. Twohy Bros. had already started the excavation for the main railway lines. The first ground was broken on the temporary spur and the wagon road to the site of the works and immediately afterward ground was broken for the foundation of the roaster building, plans for which were first completed.

It was found necessary to enlarge the quarry at Gregson and also open a new quarry in German gulch to provide the large quantities of stone that would be necessary in the foundations of the various buildings. It took some time to develop the new quarry and to do the preliminary work, but in July stone was delivered to the site of the roaster building and the masonry foundations started. Meanwhile, grading was begun at the other buildings and a large force of men and teams were employed. Camps for the accommodation of the men were built in the gulch west of the site of the works and at times three hundred men were accommodated in these temporary boarding houses.

In giving a description of the works it is best to take for a starting point the building in which the ore is first received, which is the concentrator building. The ore, as it is brought in from the mines, is delivered in steel cars on top of steel ore bins, that are about 70 feet high, and the ore is dumped automatically into these bins, which are practically two stories in height; the upper part of the bins is used as a receptacle for the ore as it comes from the mines, and the lower parts are used for storing coarse concentrates and also the ore that has passed through the sampling mill, which is situated just back of the concentrator. Custom ore and other ores necessary to be sampled are also dumped into the upper bins. These bins are partitioned off into sections, part of them being used for concentrating bins and the others for sampled ore. Custom ore and other ores that are necessary to sample are taken from the bottom of these upper bins and conveyed to the sampling mill by an electric tram car. The ore that is suitable for smelting is taken from the sampling mill, after it has been sampled, and delivered to the lower bins in this structure. All of the work is made as automatic as possible.

The sampling mill is 42 feet wide, 60 feet long and 5 stories in height. It is equipped with crushing machinery and sampling machines sufficient to treat 1,000 tons of ore per day of 24 hours.

The concentrator building proper is in two parts of four sections each. Each part is 250 feet wide by 350 feet deep. Its estimated total capacity is 5,000 tons in 24 hours. The concentrator building proper is divided into several departments; the first is called the crushing department, which is about five stories in height and equipped with heavy machinery for doing the first crushing of the ore. Eight large Blake crushers that will receive a piece of ore 10 inches wide, 20 inches long and 12 or more inches in height and crush it into cubes not larger than 2 inches in size. From these large Blake crushers the ore passes to 16 smaller crushers, and then again large rolls take the ore and crush it finer still. Between each of these operations

a separation of the gangue and ore takes place by means of automatic machinery.

The next department is the jig department, equipped with 432 Evans jigs. These jigs take the ore and separate it from the gangue automatically, and as soon as the separation has taken place the ore is automatically conveyed to storage bins and the gangue is taken to another crushing department, where it is still further crushed and again put through a separating process in jigs.

The next department is the regrinding department, where the ore is reground as fine as sand in Huntington mills of special design. This department is fitted with 16 5-foot Huntington mills and 12 6-foot Huntington mills, and another separation takes place in this department, after which the ore is automatically conveyed to storage bins. There are 144 Evans jigs in this department.

The next two departments are table departments, which treat all the fine material which the mills make. These two departments are fitted with 230 Wilfley and 28 Overstrom concentrating tables. The concentrates from the whole mill are conveyed into large storage bins constructed of timber and located at the lower end of the concentrator. These bins are 650 feet long and 70 feet wide, and will hold several thousand tons of concentrates.

Power for the concentrator and other purposes is supplied from a power house located between the two halves of the concentrator. The concentrator boiler-house is 28 feet wide and 190 feet long and contains 10 Stirling boilers in five batteries, aggregating over 3,000 boiler horse power. The coal storage for this boiler-house is provided in a section of the steel ore bins previously mentioned. The coal bins are practically of the same construction as the steel ore bins and are designed to carry storage of 2,000 tons of coal.

The power-house, in which is located the machinery for furnishing the power to the works is between the two halves of the concentrator, and it is 136 feet wide and 148 feet long. The power-house contains two 4-cylinder triple-expansion Nordberg-Corliss engines that are capable of developing a maximum load of 3,600 horse power each. In this power-house is also located one 4-cylinder triple-expansion Fraser & Chalmers Corliss engine that was originally used to furnish power at the World's Fair. This engine will develop at maximum 1,150 horse power.

Power is transmitted from the Nordberg-Corliss engine through a main-line shaft by means of 36 2-inch Manila ropes. Power is transmitted from the Fraser-Chalmers engine by means of a leather belt 5 feet 6 inches wide and about five-eighths of an inch in thickness, 175 feet long. This power-house is also equipped with two 700-kilowatt Westinghouse two-phase alternating generators and one 500-kilowatt General Electric direct-current generator, besides smaller arc light and power electric machinery.

Also this power-house contains a large amount of smaller machinery, which is practically auxiliary to the larger engines and machinery. The condensing apparatus was furnished by the Henry R. Worthington Co. All of the electric power for furnishing light to the city of Anaconda and power

for operating the street railway will be furnished from this power-house, and ample provision has been made for any increase of service that will be required in the future. The electric power that is to be used in the new reduction works will also be generated at this power-house. The total horse power of all the machinery in this building will aggregate 10,000 horse power.

There was used in the construction of the power-house building ore bins, concentrator building proper and in the steel railroad approaches to the building over 6,000 tons of steel and over 10,000,000 feet of lumber. The building itself occupies a space of nearly seven acres, and is one of the largest plants of the kind in the world. It is fully equipped with the most modern machinery for the treatment of Butte ores. The total cost of the power plants and the concentrator building approximate \$2,000,000.

The ore, after being treated in the concentrator, is stored in bins, as previously mentioned, and it is then conveyed by means of cars, hauled by compressed air locomotives, to the upper floor of the roaster building. The concentrator and roaster buildings are connected by tracks about 1,300 feet long, and in order to reach the upper floor of the roaster building it was necessary to construct a trestle work that at one end was over 50 feet high. This building is 98 feet wide and 330 feet long, and is equipped with 48 McDougall roasters. These roasters are patented by Messrs. F. Klepetko and W. J. Evans and have been developed into successful roasters by these gentlemen. They are capable of handling from 35 to 50 tons of concentrates each per day of 24 hours. The ore is delivered in hoppers that feed into the roasters automatically and the ore comes out at the bottom of the roasters ready to be taken to the reverberatory building. All of the operations are entirely automatic. This building is provided with a dust chamber 40 feet wide and 300 feet long. The power is furnished by alternating Westinghouse induction motors. It is also provided with a smoke-stack that is 23 feet 6 inches outside diameter and 200 feet high, exclusive of the foundations. Nearly 1,500 tons of steel and iron entered into the construction of the building, dust chamber and stack, besides large quantities of brick and stone. Over 2,000 tons of steel and iron entered into the construction of the furnaces.

The roaster and reverberatory buildings are connected by a series of tracks. The calcines are conveyed from the storage hoppers underneath the roasters to the hoppers above the reverberatory furnaces by means of compressed air locomotives and cars.

The reverberatory plant consists of two buildings, one building 182 feet wide and 174 feet long, the other building 182 feet wide and 225 feet long. These buildings contain 14 reverberatory furnaces. In the center, between the two buildings, there is a large stack of the same size as that of the roaster building. Four large flues from these two buildings enter the base of this stack. This building is absolutely fire-proof. Over 2,500 tons of steel and iron have entered into its construction, including the furnaces. The building is so arranged that the silica from the furnaces is granulated by means of water and carried in launders over the Butte, Anaconda & Pacific railway

tracks and deposited on the flat in front of the works. In order to carry the granulated silica it has been necessary to construct several trestles. They are constructed of cedar poles averaging from 60 to 80 feet in height. These launders are lined with cast iron liners for the full length, and are over 1,000 feet long.

The blast furnace building is the next one to be described, taking the method of treating the ore as a guide. Storage bins for receiving ore to be treated at the blast furnaces have been provided. Only part of them have been completed, but the structure is so designed that it can be filled at any time and the frame work made into storage bins. These bins occupy a space over 850 feet long and 110 feet wide; they will have a large storage capacity for materials that are to be smelted in the blast furnaces; these materials consist of first-class ore, lime rock for fluxing, converter slag, coarse concentrates, coke, etc., and all materials that are smelted in blast furnaces. Part of these bins are used for the storage of coal for the reverberatory furnaces and the boilers located in the smelter power-house. Over seven million feet of lumber have entered into the construction of these bins. The materials are delivered into these bins from the railroad cars on top of the bins, and the cars dump automatically into them.

The blast furnace building is 82 feet wide and 195 feet long. It is equipped with five large blast furnaces, which will be capable of treating over 1,500 tons of material per day of 24 hours. This building is equipped with a dust chamber 40 feet wide and 182 feet long and a smoke stack of the same size as the reverberatory and the roaster stacks. There has entered into the construction of this building, smoke stack and dust chamber over 500 tons of steel and iron and into the construction of the furnaces themselves over 300 tons more of steel and iron, besides large quantities of brick and stone.

In connection with the blast-furnace plant and storage bins there has been a briquetting plant designed that is 64 feet wide and 175 feet long, with an annex, for covering drying machines, 47 feet by 150 feet. This building is equipped with powerful briquetting machinery for the purpose of pressing fine material into brick form. These bricks will be about 3 1-2 inches in diameter and 2 1-2 inches in thickness. This material will be melted in the blast furnaces, and it is put into this shape in order to prevent losses by means of fine stuff being carried up and out into the atmosphere by the strong draft in the stacks and the blast in the furnaces.

The next to be described is the converter plant. This is a building 177 feet wide and 416 feet long. Part of this building is used for a converter repairing plant. This building is equipped with eight stalls for converters and 24 converter bowls, there being three converters to each stall. These converters are the largest that have ever been built. They are 8 feet in diameter and 12 feet 6 inches long. The estimated capacity of the plant is 500 tons of matte per day of 24 hours. This building also contains two reverberatory furnaces that receive the molten matter from the reverberatory and blast-furnace plant. The matte is conveyed by means of large ladle cars holding 20 tons of matte in each car, the motor power being compressed air locomotives. The matte can also be charged directly into the converters

without passing through the receiving matte furnaces. This building has also three copper casting reverberatory furnaces fully equipped with machinery for casting anodes and bars of copper. Slag from the converters is made into small bricks by means of slag-casting machines. The slag is poured into moulds which are carried forward by means of chain belting outside the building into receiving bins for the slag. In this building there are also two electric travelling cranes, having a span of 60 feet each. They are capable of lifting 90 tons each; also there is an auxiliary crane to be used for repairing these large cranes, just overhead. This crane will lift a load of 40 tons. In connection with this building there is a large dust chamber 264 feet long and 40 feet wide, and a stack having the same dimensions as the stacks at the other buildings in the plant.

There has entered into the construction of the converter building, dust chamber and stack nearly 2,000 tons of steel, besides large quantities of brick and stone. In connection with the converter plant there is a converter repairing plant fitted with the necessary crushing machinery for grinding clay and slag for lining the converters. The power in this building is all electric.

For furnishing power to the last two named buildings, there is a power-house known as the smelter power-house, that is 84 feet wide and 525 feet long. In this building there is located 12 Stirling boilers, aggregating 3,150 horse power; also four large direct-connected Corliss engines and Connersville blowers that will be capable of furnishing one hundred and twenty thousand cubic feet of air per minute for the blast furnaces; also another large Nordberg-Corliss triple-expansion blowing engine for furnishing air for the converters. This engine will have a capacity of 20,000 cubic feet of air per minute. In this building there will be also located two large blowing engines that are to be taken from the old works. Changes will be made on those engines that will make them more economical. They will furnish an additional supply of air for the concentrators. Also two air compressors for furnishing air at 1,000 pounds pressure for operating air locomotives and one for furnishing air at 100 pounds for ordinary purposes.

One end of this building is now used as a machine, carpenter and blacksmith shop, and is fully equipped with all labor-saving appliances for doing construction work. It is also provided with all the necessary condensing apparatus, pumps, and auxiliary machines such as is required in a large power plant of this kind. There will be an aggregate of over 5,000 horse power of machinery in this building. There is also a Nordberg-Corliss engine in this plant for furnishing power for the briquetting plant.

In general: There is a large new office building now being constructed that is 68 feet wide and 95 feet long, and the laboratory building 90 feet long and 50 feet wide. These buildings are constructed of brick and stone and are fitted with all appliances and apparatus necessary to conduct the business of this large reduction works.

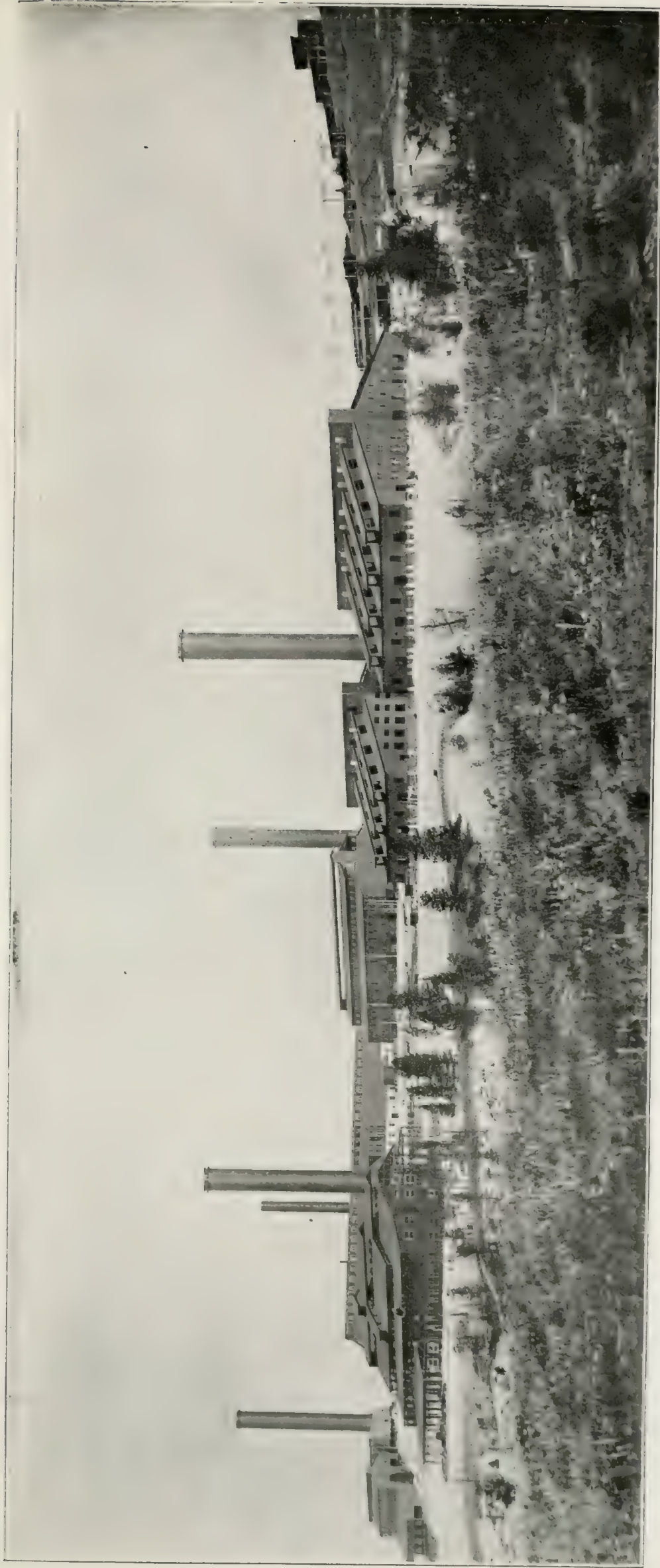
The water supply for the works is brought to the works in a flume, aggregating over seven miles in length, and capable of carrying, under ordinary

seasons, the whole flow of Warm Springs creek for several months in the year, except in flood time. This flume will carry over 50,000 gallons of water per minute, and is built so that its capacity can be increased at least 25 per cent. The flume terminates in a large screen tank, provided with screens, in order to catch any floating material that may be in the water. From this screening tank it is taken to large redwood tanks, which have about 100,000 gallons capacity. From these tanks large pipes 40 inches in diameter convey the water to the concentrator, and from another large tank the water is conveyed to the power house and other plants by means of 24-inch and 30-inch redwood water-pipe lines.

The whole works is provided with a system of standard gauge railway tracks for the purpose of carrying on the work between the different plants. They are all inter-connected, and one can travel from the upper side of the concentrator clear to the converter plant on railway lines. The motive power used is compressed air, compressed to 850 pounds per square inch. Air at this pressure is conveyed in pipes all over the works and charging stations are provided at intervals for charging these locomotives. Each locomotive has two large tanks, which contain air at 850 pounds pressure, and sufficient air will be stored in these tanks to enable the locomotive to travel a distance of half a mile under full load. Each of these locomotives weighs twelve and a half tons, and as the tracks are level where most of the work is to be done they will be capable of hauling over 70 tons of material at a trip, if necessary. These locomotives were furnished by the H. K. Porter Manufacturing Company, of Pittsburg. All of the machinery and appliances have been of the most modern type and make, and the work has been done in the best possible manner.

The construction of the works necessitated the using of 50,000 yards of masonry and the removal of over 250,000 yards of excavation. There has been used over 1,000 cars of red brick and fire brick. There has been used in the works over 30,000,000 feet of lumber, exclusive of about 5,000,000 feet more used in the construction of the flume. There has been nearly 40,000,000 pounds of structural steel and cast iron in the shape of machinery, etc., used. There has been delivered to the works over 10,000 cars of all kinds of material that entered into the construction of the plant.

Mr. Frank Klepetko has been the manager of the works, and the plant as it stands today is the fruition of his idea as to what a reduction works should be. The writer, as chief engineer, has been directly responsible to him for carrying out all the details in connection with the enterprise. Mr. R. G. Collins has been assistant chief engineer, and he has confined his time to directing the work in the field. Mr. J. W. Evans is the superintendent of machinery, and was the designer of the concentrator. Mr. A. G. Gullberg has been the chief draughtsman and the man who has been directly in charge of the large number of draughtsmen necessary to carry out and design all these great works. Mr. W. P. Taft has been the engineer in charge of laying out the work in the field, and he has had as assistants Mr. W. L. Bradley and Mr. McIntosh. Mr.



NEW SMELTER OF THE ANACONDA COPPER MINING COMPANY, ANACONDA

F. D. Joslyn has been in charge of all the carpenter work. Mr. Arch Jette has been in charge of all the stone and masonry and the construction of the furnaces. Mr. M. P. Connell has been directly in charge of all surface work and the moving of the machinery. As contractors on the work, the Brown-Ketcham Iron Works, of Indianapolis, have furnished all of the steel for the various buildings, and their agent, Mr. J. R. Keers, has been in charge of the erection of the work in the field. Messrs. Twohy Bros. & Toole had the contracts for doing the stone and masonry and the excavation. Mr. J. Ger-rick had the contract for erecting the steel smoke stacks. Mr. A. H. DeLong erected the office and laboratory buildings and had charge of the masonry for Twohy Bros. & Toole. Mr. J. P. Welsh had charge of the shops. Mr. E. W. McCanna was in charge of the outside mechanical work. F. A. Jones, as chief engineer of the construction of the flume and the railway lines on the works.

THE MECHANICAL ENGINEER AS A FACTOR IN MODERN MINING, MILLING AND SMELTING.

In the early history of mining and smelting the mechanical engineer was not considered to be of very great importance. Nearly every man managing a mine had some mechanical ideas, often too many for the comfort of the man who made mechanics his special study. It may be due to this fact that the position has not had the proper recognition due to the profession. Its importance has not been fully recognized by the men who have had to do with the managing of mines and smelters.

Today all the professions engaged in the reduction of ore are parts of a system, and its successful operation is due to the perfection of its component parts. The geologist, who studies the nature and character of the mineral veins and their bearing on the methods to be pursued in mining; the metallurgist, who defines the method of recovering the values in the ores, and the chemist, who determines the value and contents of the ore, and to whom we owe the development of explosives used in modern mining, and the mining engineer who directs the work of the miner, tells him when and where to go, measures his work, determines the extent of the ore bodies, all, in their several spheres, are important and necessary in the building up of a great mining industry. But it is of the part the mechanical engineer has taken in the development of modern mining and smelting of which I wish to speak. The subject is comprehensive and only a brief outline of the work accomplished in Butte can be given in a short address.

Little Progress in Metallurgy.

There has been little progress made in the metallurgy of copper in the past twenty years. The methods of reducing the ores are the same now as then; it has simply been an increase in the efficiency of the appliances used.

Starting with the mining of the ore, I will speak of the appliances used by the prospector. The tools required are few—a pick and shovel, a few drills of different sizes, a case of dynamite, some caps, and, perhaps, a pack-horse or mule. If he has found a ledge, he starts to develop it by driving

a tunnel or sinking a shaft. Driving a tunnel is easier, ordinarily, if the ledge is favorably located; but the probabilities are that he will have to sink a shaft. When the prospector arrives at that stage two men are needed to do the work, and an application of some mechanical means for hoisting ore is necessary. The windlass is perhaps the simplest machine in use for hoisting ore in Butte today. Such a method can only be used by the prospector who is searching for or developing a lead and the value of whose time is measured by the hope that he may make a valuable strike. Buoyed by that hope he denies himself the associations and comforts of home and society, braves the winter's storms and summer's heat, and, perhaps, after a life of privation, ends his days in a lonely cabin. This is not an uncommon experience. Often the beginning of a large mining camp is traced directly to the prospector, working with his primitive appliances.

A Triumph of Engineering Skill.

Following the hand-drill came the application of compressed air and machine-drilling. Although of comparatively recent origin, the machine-drill, as made today, is a triumph of mechanical engineering skill, and has made possible the development of our large mining interests.

Following the use of a windlass came the machine known as a whim and animal power used to operate it. If an intelligent horse is used, he becomes obedient to the mine signals the same as the men who are engaged in the work. The bucket holds perhaps from 800 to 1,000 pounds of ore and the hoisting is very slow, not over 80 feet per minute.

The next step in mining is the introduction of steam power and its application to the hoisting of the ore. A small geared hoist attached to what is termed a "gallows frame" is used, the ore being loaded in a bucket and hoisted to the surface and emptied into bins close to the shaft.

The next improvement is to use a cage in the shaft instead of a bucket and to take a small car down the shaft to the required station and fill it where the mining of the ore takes place. First, one cage was used in a single compartment shaft. Later a two-compartment shaft was constructed and two cages used in order that the ascending load should balance, in part, the descending load, the engine lifting, in ordinary running, only the weight of the ore and the rope. Then in order to increase the output of ore from each shaft, double-decked cages were used with single-acting engines powerful enough to raise the load from the bottom of the shaft. At the West Colusa mine of the Boston & Montana Company, in place of double-deck cages, single-deck cages are used in each compartment, each holding two cars. This necessitates a shaft each compartment of which is five feet wide by nine feet long.

In the Anaconda Mine.

The Anaconda Company, in order to cheapen the hoisting of ore, substituted large skips in place of the two, three and four-deck cages. Several ore bins were constructed underground at the different levels to receive the ore from the stopes. The skips are loaded from these small bins, of which are operated by compressed air. Eight to ten tons of ore are loaded into the skip and hoisted to the surface by means of powerful single-acting

steam engines. Ore bins are constructed at the top of the shafts and the ore dumped automatically from the skips into these bins.

With the increase in size of engines and loads stronger gallows frames were required. Large wooden gallows frames were made of Oregon timber, sometimes as large as 20x24 inches and 60 to 80 feet in length. Finally it was found necessary to build them of steel and they are made from 100 to 120 feet high. The first steel gallows frame erected in Butte was over the West Colusa shaft in 1897; afterwards steel gallows frames were erected at the Anaconda mines, much higher and stronger in every way.

The pumping of the water from the mines of Butte is not the least of the difficulties with which the engineer has to contend. In the early days when the mines were silver properties the water did not contain acid and could be used in the boilers, but as the ore changed in sulphides the water became more acid. Iron pipes, iron water-ends of pumps, and, in fact, wherever the water came in contact with iron it was rapidly destroyed. As the mines became deeper the difficulties increased; the water was warmer and made still more so by the amount of exhaust steam from the pumps. Simple station and sinking pumps were used to pump the water from station to station until it reached the surface. Improvements were made from year to year. Wood and lead-lined pipes were substituted for the all-iron; larger units were installed until now the water is lifted successfully 1,200 feet by compound Corliss engines with bronze pump ends.

Transportation of Ore.

The transportation of ore was first done by pack-horses and mules. They carried sacks of ore away from the prospect holes to the point of shipment. Later came the construction of roads, after which wagons were used. Nowhere, perhaps, are such large and heavy wagons in use for transportation of ore as those made and used in Butte. Six and eight-horse teams pull as many tons in these wagons. Later on, the railroad was built close to the shafts, where ore bins were constructed to which the ore was trammed or dumped by the skips and finally loaded into cars carrying from 15 to 20 tons. The mechanical construction of the ore cars has been so perfected, steel having been substituted for wood, that they carry today 50 tons each, reducing the cost of transportation to about one-half cent instead of 50 cents or \$1.00 per ton per mile, as it was originally. Now it is common to see one engine pulling a train carrying 2,500 to 3,000 tons of ore.

There has not been much attention given to the transportation of ore underground as yet. All the ore originally mined, and most of the ore today, is trammed by men from the stopes to the shaft station, but in the last five years horses are being used in some of the mines. It is interesting and amusing to see them strap a horse and send him down a shaft that is only four feet by four feet six inches in the clear. In these mines there are stables underground and the horses are seldom brought to the surface. At the large shaft of the West Colusa the horses are lowered and raised every shift, and they know as well as the men when it is time to quit, and they are always waiting to step aboard the cage and come to the surface. the large com-

panies are constantly at work on this problem of underground transportation, and no doubt some satisfactory solution of the question will be arrived at either by the application of compressed air or electricity.

Concentration.

The first step in the treatment of the ore is concentration. The first copper that was mined in Butte was encountered in the bottom of the shafts of the properties that had been started as silver mines. Originally the only ore that could be shipped at a profit was that carrying very high values in copper and silver.

The first concentrator was built in Butte by the Montana Copper Company (afterwards the Boston & Montana Company), during the winter of 1879 and 1880.

The principal improvements in concentrating have been made by means of coarser crushing and concentration. This was only made possible, however, by the development of blast-furnace smelting. In reverberatory smelting it is necessary to crush ore much finer in order to produce high-grade concentrates that can be roasted. The tendency has been at all times to make a concentration of the ore in as large sizes as will permit a gravity separation of ore of a required mineral percentage. The Butte & Boston Company made jigs that would handle ore passing through screens having two and a half inch openings. After the coarse concentrates are taken out the work of crushing and grinding the ore or "middlings," as it is termed, is carried on step by step, until now no tailings are made that will not pass through a one to one and one-quarter millimeter screen. Various types of machinery for fine crushing have been designed. Chile mills of different forms have been tried, but so far Huntington mills are used in preference to the other type. Small three and one-half foot ones were first used for fine grinding in Butte in the lower works of the Boston & Montana Company, in the summer of 1894. Five-foot mills were tried at the Butte & Boston concentrator in 1887, but the first ones made were too light. Their mechanical construction has been continually improved and their capacity increased. At the new works of the Washoe Company six-foot mills are used that were designed in the engineering department of the company.

Steam stamps were used by the Anaconda Company and the Butte Reduction Works, this being an adaptation of the Lake Superior practice to the reduction of ores. The great difficulty with stamping has been the fact that it made too large a proportion of slimes. This was early recognized by the different concentrator men.

The Great Falls Concentrator.

In 1890 and 1891 the Boston & Montana Company built their concentrator at Great Falls. At that time there was a question as to whether they would use stamps or rolls and crushers. One section of the mill was fitted up with the stamp and all necessary machinery for treating the ore; the other sections were fitted with rolls and crushers, although at that time the mill was designed with reference to adopting steam stamps. Later, experiments showed that the crushers and rolls were better and the stamps were taken out.

The Anaconda Company started to build their upper works in 1883 and 1884, using at first crushers and rolls, later substituting steam stamps. The repairs on the stamps are less, as a whole, than on the crushers and rolls, but the losses are greater, owing the quantity of slimes produced. In the designing of the Washoe concentrator it was determined to use crushers and rolls entirely.

Calcination.

The next step in the reduction of the ores is the calcination or roasting of the fine concentrates. The first furnaces used for this work were reverberatory calciners, in which the charge had to be moved by hand from one end of the furnace to the other. This was a slow and laborous process, besides being very expensive. Owing to the high price of labor and the low capacity of the furnaces, which was only about 10 tons in 24 hours, it was soon found necessary to adopt some mechanical means for stirring the ore. Quite a number of different furnaces were designed and patented for mechanical roasting.

Some of the best known in the Butte district, of the open-hearth type, are the Pearce furnace, now in use at the Colorado smelter; the Brown-Allen-O'Hara, in use at the Butte & Boston; the Keller-Cole and Gaylord, at the Parrot, and the four-hearth Holtoff-Wethey furnaces, in use at the Butte Reductions Works. Nearly every master mechanic and superintendent who was in charge of the work at the different plants had a patent calciner.

At Anaconda the original calcining plant consisted of 28 reverberatory furnaces. In 1888, or about that date, two small Brueckner furnaces were installed in the upper works. These Brueckners gave such satisfaction to the Company at the time that in the building of the lower works it was determined to install a complete Brueckner calcining plant, which was the largest of its kind in the world. It consisted of 96 Brueckner furnaces 10 feet in diameter and 20 feet long, their capacity being from 12 to 15 tons per day. Later on, the upper works were remodelled and 40 more were installed.

Heat From the Ore Itself.

Early in the history of the calcining of the Butte ores the opinion was advanced that a calciner would be designed some day in which the heat necessary for the desulphurization of the ore would be obtained from the ore itself. This was first accomplished by the introduction of the Herreshoff furnace in the Montana Ore Purchasing Company's plant in Butte, about the year 1896. Small calciners about 10 feet in diameter, having five hearths, were built and successfully operated. This was quite a step in mechanical roasting. Still the capacity of the furnaces was small. Shortly after the introduction of the Herreshoff furnaces in this plant the question was taken up by the Boston & Montana Company at Great Falls of designing a furnace that would have greater capacity and less repairs than the Herreshoff. A roaster was built on the same lines, 16 feet in diameter, and called the McDougall, having an air-cooled shaft and solid cast-iron arms. This furnace had eight hearths.

It was tried, but was not very successful on account of the long arms and

rakes. The heat developed was too intense for the cast-iron arms, and they bent down under their own weight. It was then found necessary to cool them and a design was made to use air. This was not satisfactory and later a water-cooled shaft was substituted and the number of hearths reduced to six. This proved very successful, and with the development of the mechanical details the McDougall furnace stands to-day pre-eminent as an automatic calciner as far as repairs and cheapness of operation are concerned.

Heap Roasting.

In early times it was necessary to calcine the ores for use in blast furnaces. This was done by means of "heap roasting." It was due to the gases produced by these heaps that the smoke of Butte became notorious. The blast-furnace practice of to-day was not known at that time. To desulphurize the rich ores, large heaps—practically dumps of ore, were built over a layer of wood about two feet deep and fire started. This heat was sufficient to ignite the sulphur in the ore. By and by the whole mass became heated and the sulphur was driven off. It would take a month or more to roast a heap, depending upon its size. A slight improvement was made in the method of taking care of the smoke by the construction of stall roasters. The stalls were about eight feet long and six feet wide, arranged in two rows with a flue between, this flue being connected to a stack. This is still a good method where blast furnaces are used and there is no converting plant.

The first smelting done in Butte was in reverberatory furnaces at the Colorado smelter, about 1880, when Mr. Henry Williams built two furnaces having hearths about nine feet wide and fourteen feet long, and using cordwood for fuel. These furnaces were charged by hand, the roasted ore being wet down and then shoveled into them from the side doors. If they smelted from 12 to 15 tons in 24 hours, they were considered to be doing good work. At the old upper works in Anaconda the first furnaces built were 10 feet wide and 16 feet long. They were also fired with wood and charged by hand. Each furnace had an individual stack. It was soon found necessary to increase the size, and so they were enlarged step by step until in 1889 they were something like 12 feet wide by 18 feet long and the capacity had been increased to 30 or 40 tons per day. The dimensions of the furnaces were further increased in width and length and this necessitated different means of charging, so hoppers with bottom gates were placed above them into which the charge was dumped; corresponding holes were made in the roofs of the furnaces; these were covered with brick slabs. The tramming of the ore to the hoppers was done by hand and with small cars, and it is the method in use at most of the plants today.

USED IN WASHOE WORKS.

In 1899 the Colorado company built a furnace that was 20 feet wide and 50 feet long. The Butte & Boston company built one like it at the same time. These furnaces have been quite successful and are the size adopted at the new works of the Washoe company. One of the late improvements made in the mechanical construction of furnaces is the substitution of heavier binding irons and 12-inch brick in the roofs in place of

the 9-inch formerly used. These furnaces have a capacity of 100 to 150 tons in 24 hours, as compared with the original 12-ton furnaces. In 1890 and 1892 the Boston & Montana company at Great Falls introduced gas fuel for the smelting of ores.

As the slag dumps increased in extent and the wheeling of slag became more expensive, large slag pot cars were designed that would hold from five to eight tons, using horses for pulling them to the dump where they were emptied by means of hand-gearing. The application of electricity to this work was introduced at the Butte Reduction Works, followed by the Montana Ore Purchasing company, Parrot company and Colorado Smelting company. The Butte & Boston company were still moving their large slag cars with horses until 1899, when they adopted electric motors.

Matte Cast Into Moulds.

The matte from all the old plants is cast direct from the furnace into moulds sufficient in number to take the full charge. In early days, a furnace-man thought four tons of matte was a good tap, but now they often tap 40 to 50 tons at one time. This may represent the metal of one or more days smelting. The Boston & Montana company, at Great Falls, introduced the practice of taking the matte direct from the reverberatories to the converters. In this case only 5 to 10 tons are tapped at a time. At the new works of the Washoe company, the matte is tapped into large 15-ton ladle cars and then taken in a molten condition directly to the converter plant and charged into the converters, or storage furnaces.

Not the least interesting development in the progress of modern copper smelting is the utilization of the waste gases from reverberatory furnaces for generating steam. This has been common practice in iron blast furnace smelting, but was not applied to reverberatory furnaces smelting sulphide ores, until within the past two years. The result was very gratifying, so much so that arrangements are being made to build a boiler in connection with each furnace at the Washoe works. The time is not far distant when all the boiler power required to run a whole smelting plant will be generated by the waste gases from the furnaces, utilizing the heat from the sulphur as well as the gases from the coal used in smelting the ore.

The First Blast Furnace.

The first blast furnace smelting done in Butte was near the site of the Parrot mine, and was said to be in an experimental brick furnace, using a blacksmiths bellows for blower. In 1880, the Montana Copper company, in their upper works, started their first blast furnace. This furnace was made in Denver and was said to have had cast iron water jackets. Connections to the tuyeres were made in heavy canvas tubing. Air was furnished by a small Baker blower. The first steel water jacketed furnaces were built for the same company and were about 36 inches by 84 inches wide, with six tuyers on each side.

In 1894 a new blast furnace 36 inches by 120 inches was built for the Boston & Montana company, in Great Falls. At that time it was determined to try a larger settler, one that would hold sufficient matte to charge a con-

verter. This settler was about 10 feet in diameter and three high. It was thought at first that the matte would chill so that it could not be tapped, but this difficulty, with others, was overcome in 1888 when the Anaconda company built two small experimental stationary converters and set them on four-wheel trucks. This truck was moved in and out of the stalls on tracks. They were tilted by hand and in much the same manner as large slag or matte ladles are tilted today. They were about four feet in diameter and seven feet high. In lining it was necessary for the man to enter the converter head first to finish the claying, which was exceedingly uncomfortable and inconvenient.

Otto Stallmann's Converter.

In 1890 Mr. Otto Stallman, who was at that time superintendent, designed a stationery converter of a slightly different shape to that used by the Parrot company. Twelve of these were installed in the upper works and were run for about four years. In 1892 they built their present old works converter plant, using the Parrot type making it 6 feet in diameter and 10 feet high.

In 1892 the Boston & Montana company in building their converter plant, adopted practically a steel converter that was 7 feet diameter and about 13 feet high, and was the largest in use at that time. Later, in the erection of the Butte & Boston converter plant, a converter known as the "barrel" type was adopted; with this less blast pressure is required than in the upright converters.

At the Washoe Company's works designs were made in the engineering department for a still larger converter of the barrel type, 8 feet in diameter and 12 feet 6 inches long, weighing when charged about 60 tons. The matte is tapped directly from the reverberatory and blast furnaces into 15-ton ladle cars and taken to the converter plant by compressed air locomotives. The matte is poured into a hopper from which launders carry it to the converters.

Stationary Refining Furnaces.

At the Washoe works, stationary refining furnaces capable of holding from 120 to 150,000 pounds of copper, were installed. A casting machine is placed in front of each furnace. The copper runs from the furnace into a small tilting ladle and is poured into the molds on the machine. Hydraulic power moves both ladle and casting machine. The molds and copper are cooled by a spray and then are pinched out of the molds by men standing at the end of the machine. The copper then goes into a bosh in which there is a conveyor partly submerged in water, where it is further cooled and is then brought out and dumped onto the floor when it is weighed and loaded for shipment.

The last process in the refining of copper is the electrolytic in which the gold and silver and the remaining impurities are separated. The method is electrical and chemical, and yet mechanical appliances enter largely into the work. The principal improvements of later years have been greater economy in the productive power by the use of large generators, direct-connected to water wheels or engines. The problem is to produce cheap electrical energy in enormous quantities.



VIEW OF DR. NUNGESSER'S MILL AT GARNER

MINING LAWS OF THE UNITED STATES.

The following synopsis of the mining laws of the United States was prepared for the Bureau by Hon. J. B. Clayberg, who has been for a number of years retained by the Michigan State University to prepare and deliver lectures and opinions upon this important subject. This synopsis will be found of great value to all mining men, prospectors and others as a work of reference, embracing, as it does, definitions of all terms used in mining law, as well as a history of mining legislation and the legal points involved. The whole applies to mining claims, both placer and quartz, in the State of Montana. This information was deemed of such supreme importance that Judge Clayberg was engaged to deliver a series of lectures embracing these topics before the students of the Montana School of Mines. The lectures follow:

These lectures treat only of mines in the public domain of the government of the United States, and will, therefore, not apply to any state which had no such public domain at the date of the passage of the mining acts by Congress. By express enactment these acts are not applicable to the states of Michigan, Wisconsin, Alabama, Kansas, Minnesota and Missouri.

Only two classes of mines will be considered: Quartz mines and placer mines. The provisions of the statute with reference to coal lands will also be considered incidentally.

Quartz Mines:—This class embraces those mines in which the mineral is found in the condition and position in which it is supposed to have been deposited, and appear enclosed in fissures, crevices and seams in the natural rock.

Placer Mines:—This class embraces those deposits in which, by force of nature, the mineral has been moved from its original position and somewhat changed in its character.

Quartz mines may be divided into three general classes: First, fissure veins; second, contact veins; third, blanket veins.

There are many other kinds of ore deposits, such as segregated veins, spurs, angles, stockwork, lenticular masses, kidneys, etc., dependent upon the character of the enclosing formation and the nature of the deposits.

Fissure Veins:—These veins are formed in openings, rents, breaks, fissures, or ruptures in the earth's crust. These openings are found filled with what is known as the vein, lead or lode, and vein or lode matter.

Contact Veins:—These veins are of the same nature as fissure veins, but are found along or near the contact between rocks of different character or ages.

Blanket Veins:—These are practically horizontal deposits, and are not fissures.

Definitions.

Dip:—The dip of a vein is its departure from the perpendicular on its descent into the earth.

Course or Strike:—The course or strike of a vein is the length of the fissure, or vein, running with the surface of the earth.

Country Rock:—This is the formation enclosing the vein or fissure.



BIRDSEYE VIEW OF GILT EDGE.

Walls:—The walls are the point of contact between the veins and the enclosing formation or country rock.

Foot Wall:—The foot wall is the point of contact on the lower side of the vein, or that upon which the vein rests.

Hanging Wall:—The hanging wall is the point of contact on the top of the vein, or that which rests upon it.

Talc:—Talc is the selvage or material found along each wall of the vein.

Frozen Vein:—Frozen veins occur where the vein is so intermingled with the enclosing formation, or the country rock is so impregnated with mineral as to render it almost impossible to ascertain the exact point where the vein ceases and the country rock begins.

Pinched Out:—This is a miner's phrase, and refers to a condition in which the walls of the vein converge until they meet.

Ore:—Ore is a term designating such parts of the vein as are mineralized.

Gangue or Waste:—Gangue or waste is the vein matter which is not mineralized.

Ore Shoots:—These are impregnations of ore in the veins so far as the same are continuous.

Cross Veins:—Cross veins are those which cross each other on the course or strike, being formed by fissures or breaks at different dates and in different directions.

Shaft:—Shaft is an opening sunk perpendicularly from the surface of the earth downward.

Inclined Shaft:—This is a shaft sunk from the surface along the incline or dip of a vein.

Levels:—Levels are horizontal openings excavated along the course of a vein.

Winzes:—A winze is an opening sunk downward on the vein starting at the bottom of a level.

Upraises:—These are openings made upward on the vein starting from the top of a level or stope.

Stopes:—These are divided into two classes, overhead and underhand.

Overhead Stopes:—These are formed by the extraction of the ore in a vein commencing at the top of a level and continuing upward.

Underhand Stopes:—These are formed by the extraction of the ore from a vein beginning at the bottom of a level and continuing downward.

Sumps:—These are wells or openings at the bottom of a shaft in which to collect the waters from the vein.

Adits:—An adit is a horizontal opening from the surface along the vein.

Cross-cut:—A cross-cut is an opening run through the country rock and intended to cross the vein at some angle.

Sources of Mining Law.

There are three sources of mining law: First, the legislation of Congress; second, the legislation of the different states and territories in harmony with the existing acts of Congress; third, the customs, usages and rules of miners not repugnant to the acts of Congress, or the laws of the states and territories in which they are so established.

Miners' customs, rules and usages form the common law of mines, and were particularly the outgrowth of necessity. When they originated there was no legislation upon the subjects, and no legally organized courts for the enforcement of any laws, and they were adopted by the miners for the purpose of designating, specifying and protecting the rights and property to which the miner might be entitled. They were recognized by the legislatures of the territories and states when organized, and also by courts when they came into existence.

The following authorities may be examined as to the origin, character and extent of miners' rules, customs and usages:

Johnson vs. Kirk, 98 U. S., 453.
Morton vs. Solambo Co., 26 Cal., 527.
Mallett vs. Uncle Sam Co., 1 Nev., 188.
Sullivan vs. Hense, 2 Colo., 424.
Saint Louis Co. vs. Kemp, 104 U. S., 636.
Argonaut Co. vs. Kennedy Co., 63 Pac., 148.

Presumptive Licenses:—In the absence of congressional legislation the



120-STAMP MILL AT PONY.

courts formulated a presumption that the government licensed all miners to prospect and operate mining ground. *Old Hill Mining Company vs. Ish*, 5 Ore., 104.

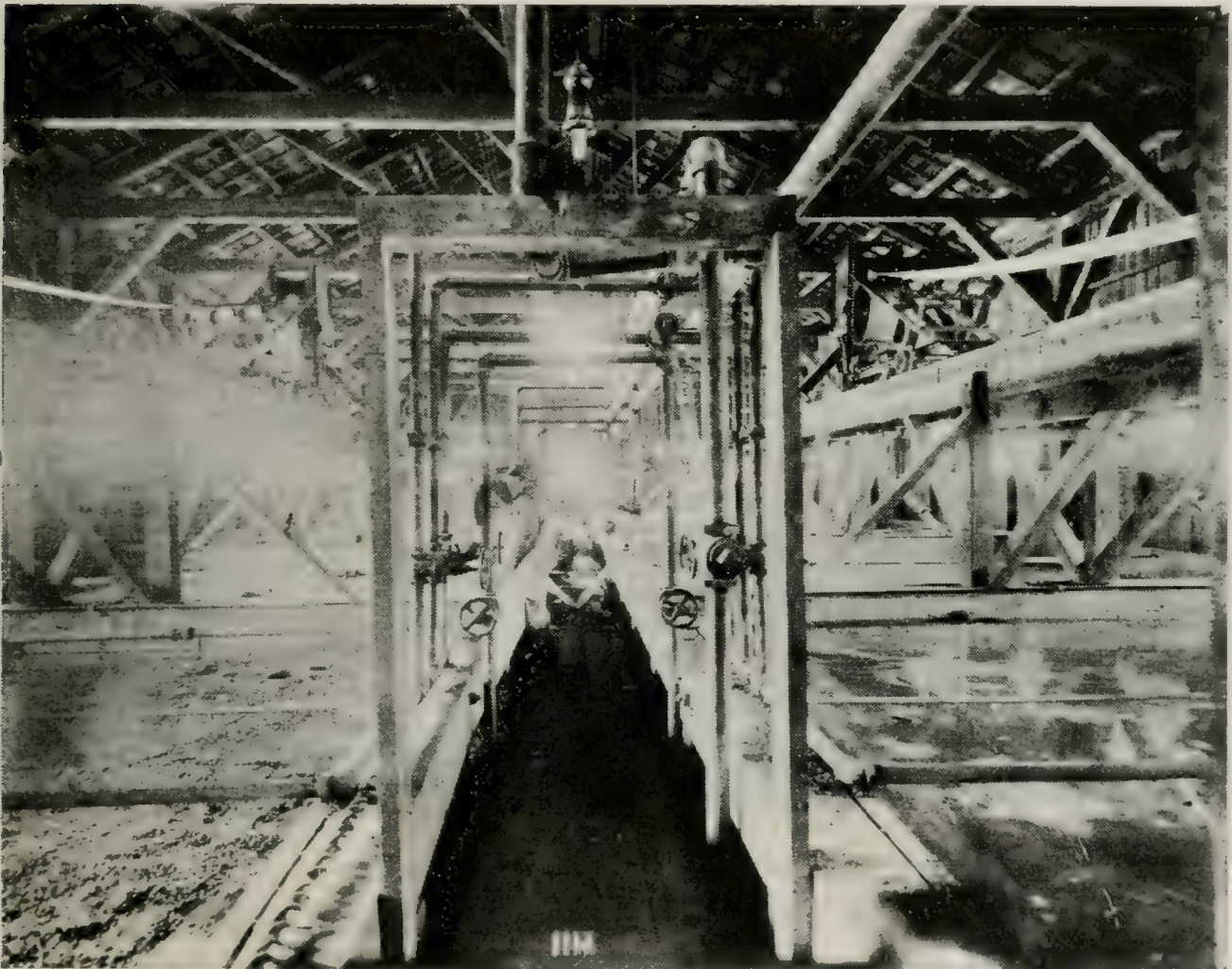
History of Mining Law.

Consult the various legislative enactments of California and Nevada from the date of the treaty of Guadalupe Hidalgo in 1848 up to the first congressional legislation recognizing possessory rights of miners; also the action of President Tyler and the papers submitted to Congress by him relative to the property acquired by this treaty, which may be found in Rock-

well's Spanish and Mexican law, page 400; also consult Yale on mining claims and water rights. See also the letter of the Hon. William M. Stewart, senator from Nevada, to Senator Ramsey, of Minnesota, found in Appendix 1, volume 3, Wallace's supplemental court reports; see also the debates of the United States relative to the passage of the first mining act.

The first legislation was enacted by Congress on the 27th day of February, 1865, and only referred to possession. Sec. 910, Revised Statutes of the United States.

The next step was the act of July 4, 1866, which reserved all lands from



TANK ROOM OF THE KENDALL CYANIDE MILL

sale which were valuable for mineral. Sec. 2318, Revised Statutes of the United States.

The next was the act of July 26, 1866, which furnished the method whereby patents could be secured from the government for quartz mines.

The next was the act of July 9, 1870, allowing a miner to obtain a patent for a placer claim.

The next was May 10, 1872, by which the then existing mining laws were revised and compiled. This is now chapter VI, title XXXII, of the Revised Statutes of the United States.

Outline of Course.

1. What property rights may be initiated, upon what land, by whom, and how initiated.
2. How such rights may be continued or lost.
3. How such rights may ripen into an absolute title.
4. What extraordinary or peculiar rights are given by the statute or follow as incident to its provisions.



MAIDEN, FROM MAGINNIS MILL.

The first steps arise under sections 2319, 2320 and 2324 of the Revised Statutes of the United States.

Location:—Location is defined to be “the act appropriating mining claims according to established rules.”

Mining Claim:—This is defined as “a name given to that portion of the public mining land which the miner, for mining purposes, takes up and holds in accordance with mining laws, local and statutory, a parcel of land containing precious metals in its soil or rock.”

The requisites provided by statute to valid location of a quartz vein are:

1. A discovery of a valuable vein or lode containing one or more of the minerals mentioned in section 2320 within the limits of the claim sought to be located.
2. Such discovery must be upon the unappropriated lands of the United States.

3. The location can only be made by a citizen of the United States, or one who has declared his intention to become such.

4. The vein or lode sought to be located must be in place.

5. A mining claim cannot exceed 1,500 feet in length along the vein or lode, or 600 feet in width, 300 feet on each side of the vein or lode, nor can it be less than 50 feet in width, 25 feet on each side of the vein or lode.

6. The location must be distinctly marked upon the ground so that its boundaries can be readily traced.

7. If a record of the location is required by local customs or rules of miners in the district, or by the laws of the state or territory, such record must be made, and it must contain the name or names of the locator or locators, the date of location, and such a description of the claim or claims located by reference to some natural object or permanent monument as will identify the claim or claims.

8. The local rules and customs and the requirements of all statutes of the state or territory not inconsistent with the congressional act must be complied with.

Definitions.

Vein or Lode:—Vein or lode is a body of mineral or mineral-bearing rock within defined boundaries in the general mass of the mountain.

In Place:—It is required that the vein or lode be in the general mass of the mountain. It cannot be on its surface or covered by movable parts called slides and debris, but if it is in the general mass of the mountain although the enclosing rocks may have sustained fractures and dislocations in the general movement of the mass it is still in place.

On What Ground:—Must be unappropriated public domain. Cannot be an Indian reservation.

1. If the suit be one to determine who is entitled to a patent, if either party to such suit is an alien and not then naturalized, this fact will be fatal to his suit.

2. If the suit be one to determine who is entitled to a patent and the title has passed through an alien but at the time of the action is vested in a citizen, it will not be fatal.

3. In suits between the parties with reference to the title to the claim in dispute, aside from suits to determine who is entitled to a patent, it makes no difference if the title has passed through an alien or is then held by one.

4. While the statute provides that no one may locate a claim except a citizen of the United States, or one who has declared his intention to become such, yet no one except the government can raise the question or oust such locator.

Discovery.

This is simply obtaining knowledge of the existence of a vein in place, containing one or more of the minerals specified in the statute, within the limits of the claim sought to be located.

But one location can be made from one discovery.

The locator need not be the first discoverer of the vein.

Discovery need not precede the other acts of location, if duly made before adverse rights attach. But the loss of the right to the place of discovery is fatal to a location.

The statute requires that the location must be so marked upon the ground that its boundaries can be readily traced.

A call for stakes is satisfied by trees cut off, blazed or squared. All the corners of the claim should be marked, if possible. The statutes of Montana provide how the boundaries shall be marked. (Laws, 1901, page 140); they also provide the time within which the boundaries must be marked. (Laws, 1901, page 140).

Where there is no statute the locator is allowed a reasonable time to mark his boundaries, but he must not be negligent or others may locate over him and claim the ground.

The location may be saved by a proper marking even after the time limit has expired, if no adverse rights have attached.

The stakes and monuments marking the boundaries may be placed upon ground already located or even patented, if so placed peaceably.

After the location has been legally made the mere alteration of marks or the removal of stakes, if without the locator's fault, would not divest him of his claim.

Whether the boundaries have been sufficiently marked is always a question of fact.

A location staked in excess of the amount or area allowed by statute is not absolutely void as to the entire location but only as to the excess.

If, however, the location is made so large that it would not be deemed the result of innocent error, fraud will be presumed and it would be void as against another location made in good faith.

Surface boundaries may be swung around within the time limited by the statute for recording certificates of location if no intervening rights have attached.

Posting Notices.

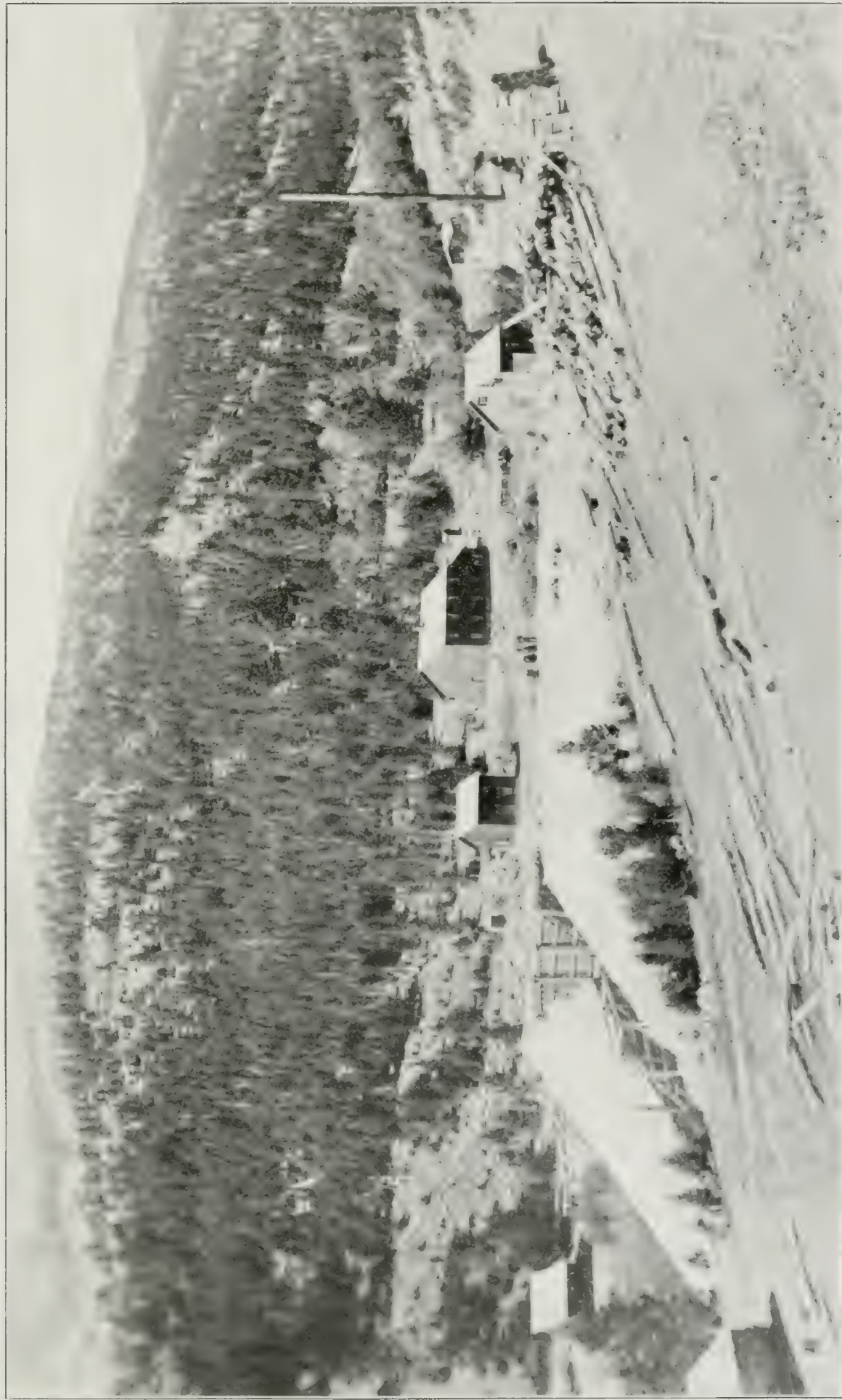
The statutes of Montana prescribe the character of the notice and the place of posting (Laws, 1901, page 140). If the state statute or local rules or customs do not require this posting to be made it need not be done.

Whatever the statutes or local rules require in regard to these notices must be followed. Unless the statute require otherwise this notice need not contain a description of the claim by a reference to natural objects or permanent monuments. Forcible eviction excuses a party from complying with the act in completing his location within the time limit, thus, being driven away by Indians.

A locator may adopt as his own work all that done by the ejector.

The Recording of the Claim:—The statutes of Montana provide the character of the instrument to be recorded, and where it shall be recorded (Laws of 1901, page 140).

In the absence of local regulation, custom or statute, no record need be made. If required it must "contain the name or names of the locator or locators, the date of location, and such a description of the claim or claims by a



GREY EAGLE MINE, HIGH ORE GULCH, JEFFERSON COUNTY

reference to some natural object or permanent monument as will identify the claim." Revised Statutes of the United States, 2324. When required it is a part of the act of location.

The date of the location in the record must be correct. If the locator lodges his certificate with the proper officer for record within the time limited by statute, and the officer notifies him that it will be recorded, the locator had done all that is required of him, and such action is equivalent to a record.

Purpose:—The purpose of the record is to identify the claim with reasonable certainty. A mistake in the record will not void the location if the property can be identified by applying the record to the stakes and monuments as they actually exist on the ground.

Natural Object or Permanent Monument:—The following have been held sufficient: Another claim; two mountain peaks; tree blazed and squared; rock monuments and prospect hole; a creek; a mountain; a stake; a tree.

A notice calling for the discovery of the claim itself, and its own stakes, is sufficient, standing alone.

A recorded certificate describing the claim as 200 feet long by 600 feet wide giving mining district, county and territory, and the exterior boundaries by reference to stakes, and referring to the adjoining claims is *prima facie* sufficient; but evidence may be always heard to show its insufficiency.

The question as to the sufficiency of the description is a fact, and should be left to the jury. If it contains such a reference as might under any circumstances be insufficient it becomes a question of fact.

Natural objects or permanent monuments need not be on the ground located, although they may be, and may consist of a permanent post or stake planted firmly in the ground, or a monument or rock, or even a shaft sunk in the ground.

Verification.

The statutes of Montana require the recorded certificate to be verified.

If required, verification of the recorded certificate becomes a part of the act of location.

The fact that the custom had not been to follow the statute closely is no excuse. The maxim "*Communis error facit jus*" does not apply.

The verification must extend to all matters required by the act of Congress to be stated in the record, and also such other matters as the state statute requires.

Although the verification is signed by affiant it will be insufficient unless also signed and officially sealed by the notary. Such commission cannot be supplied by parole proof.

But the name of the affiant need not be inserted in the verification if it is signed by him and the notary's name and seal are attached.

An affidavit bearing date one year prior to the date of location, as disclosed in the certificate, in the absence of evidence showing mistake will be insufficient.

A defect in the record as to the description of the boundaries of the claim is cured by the marking on the ground, if it has been properly done.

If the record is not made within the statutory time the location does not

become invalid; provided the record is made before other rights intervene. It will be good at least from the date of the record.

The fact that the recorded certificate describes property as being located in the wrong county, when it was sufficiently described by other proper references and recorded in the proper county, does not invalidate the claim.

Courses and Distances.

Monuments control courses and distances. A statement describing a claim by metes and bounds and giving no description of the corners or mark-



800-HORSE POWER INDUCTION MOTOR DRIVING AIR COMPRESSOR AT NEVER SWEAT MINE, BUTTE.

ings thereon is not valid, where the law requires the recorded statement to contain the location and description of each corner with the markings thereon.

Miscellaneous Cases on Question of Location:—Where both parties claim under the same location neither one can contest its validity.

A location may be made by an agent, and this without the knowledge or consent of the principal, if he afterwards accepts the location.

A trust results in favor of the old owners of a claim against parties relocating it in their own names where they were instructed to locate it in the names of the old owners and for their benefit.

Relocation by one standing in a fiduciary position inures to the benefit of the cestui que trust.

Possession.

Possession without location is sufficient to allow the party in possession to maintain the same as against a trespasser but not as against one who enters peaceably and makes a valid location.

The subject divides itself into questions as to the right of possession at and before each step in making a location has been taken, as: First, Rights before discovery; Second, Rights after discovery and before marking boundaries; Third, Rights after marking boundaries and prior to the recording of the certificate of location.

A legal right of possession only arises from a valid location. There are no statutes or decisions upon the question of the rights of a locator before discovery, but I believe that one who enters upon the public domain in good faith to explore the ground for the purpose of making a discovery will be protected in this right if he acts diligently. After discovery the courts will maintain him in possession unless he is negligent.

The courts will also maintain a locator in his possession if he acts in good faith and without negligence after marking the boundaries and before he makes his record. If, however, one in possession allows another to enter peacefully and to perfect a location he loses his possessory right.

State and Territorial Legislation.

The authority for this legislation is provided for in sections 2324 and 2338, Revised Statutes of the United States. All such legislation must be supplemental to the Statutes of the United States. What has been fully covered cannot be interfered with. What has not been fully provided for with reference to permitting steps of location may be provided by local legislation.

Of course, after patent, the state or territorial legislatures are released from all inhibitions. The land ceasing to be a part of the public domain and passing to private ownership, it becomes subject to the legislative jurisdiction of the locus. Of course, rights given by the patent under congressional statutes cannot be interfered with.

In short, state or territorial legislation may be upon almost any subject relating to the location and working of mines so long as there is no interference with the disposal of the public domain and no conflict with the mining statutes of the United States.

Effect of Valid Location.

The effect of valid location is to segregate the territory inclosed within the boundaries of the claim from the public domain, and insofar as everybody is concerned the locator is entitled to the exclusive possession and enjoyment thereof until it is forfeited or abandoned; he can protect himself against invasion as fully as though the ground were patented, even as against the government itself.

The valid location is real estate transferable and descendible as such; but is not subject to dower.

How Rights Acquired By Location are Continued.

Discovery and appropriation are the source of title to a mining claim, and development by working the condition of continued ownership until patent is obtained.

Section 2324 of the Revised Statutes of the United States, provided for what is known as "annual labor," and requires the locator of a claim located after the tenth day of May, 1872, to perform on each location during the year \$100 worth of work until the claim is patented. The statute also requires that \$10 worth of labor shall be performed, or improvements made, each year on every 100 feet in length along the vein of a location made prior to May 10, 1872.

The statute also provides that unless the work is done forfeiture of the location will follow. The statute means that the labor should be worth \$100, and not that it enhances the value of the claim \$100. The work must be done on the claim or be of such a character as will tend to develop the claim or facilitate the extraction of metals it may contain.

A house built 200 feet away from a claim cannot be counted, although built for the use of miners in working the claim. Neither can such building be counted if erected on the claim unless it has been placed there for the purpose of benefiting the claim and for its improvement.

Picking rock from the walls of a shaft or from the outcroppings of a lead on the surface from time to time and testing it for the purpose of finding pay ore cannot be allowed, because it does not tend to develop the claim. Erecting upon the premises and occupying a house for residence and another for a blacksmith shop does not comply with the law. So the expenditure of money in traveling about recording matters connected with the claim cannot be allowed.

Where there is machinery on a claim and the mine is idle, the money paid to a watchman has been allowed. Prospecting and building a road has been allowed. The work may be done off the claim entirely if it tends to develop the claim. The entire year from December 31 to December 31 is allowed in which to complete the work. Work done by a third person on the claim under an adverse interest cannot be purchased by the locator and applied as his work.

Where contiguous claims are held in common the work may be done on one claim, provided it is so intended and tends to develop all of the claims. The amount paid for the work is not conclusive of its value. If the work is done and not paid for it is sufficient. But the forfeiture is clear where the work has not been done. If, however, the original locator, his representatives or assigns, in good faith resume work upon the claim before a re-location by another, there is no forfeiture. But such resumption of work must be done in good faith, and must be continued until full representation is completed.

Under the law it is questionable whether or not the location is saved by the resumption of work at any time before a re-location by another is complete, or whether the resumption of work must take place before another

person begins the adverse location of the claim. The authorities are practically at conflict upon this point.

No work need be done after final entry for patent and payment of the purchase money to the government. But it must be done even after final entry unless the money is paid therefor. Mere threats of prevention of work are not sufficient to excuse it. It is the duty of the locator to attempt to do his work; but it is a sufficient excuse for not doing the work that the locators or owners are driven away by the Indians.

Where the statute provides—as in Montana Political Code, section 3614—for filing proof of representation, and makes the record *prima facie* proof, it does not preclude other proof. By the amendment of 1875 Congress provided that where a person or company has or may run a tunnel for the purpose of developing a lode, the money so expended in the tunnel may be taken and considered as expended on the lode or lodes, and that such person shall not be required to perform work on the surface of the lode or lodes in order to hold the same. Forfeiture operates in the same way, irrespective of the grounds causing it.

Section 2324, Revised Statutes of the United States, provides a method under which one co-owner may advertise another co-owner out of the property if he fails or refuses to perform his share of the annual representation, or refuses to pay his share of the cost thereof.

Legal Rights to Location.

The locator may lose all of his rights by the abandonment of his location. Abandonment is a question of act and intent and operates instantaneously. There must be a voluntary act, and the statement of a party that he did not intend to abandon is not conclusive. It cannot be presumed from lapse of time, but lapse of time is evidence of abandonment. Going away from a claim without intention of repossessing it and regardless of what may become of it, is an abandonment. It may arise from a single act, or from a series of acts continuing through a long space of time. The title absolutely ceases when the abandonment is complete, and the property reverts to the public domain. The statute of limitations has nothing to do with abandonment, neither does it involve an estoppel.

Where the deputy mineral surveyor, by mistake, omits a portion of a claim when surveying the same for patent, without the knowledge and consent of the claimant, such omission cannot be construed into an abandonment. Of course there can be no abandonment without prior possession. Being driven away by Indians is no abandonment, because there is no intent to abandon. The question of abandonment is always one of fact.

Application for a Patent for a Mining Claim.

The proceedings are governed by sections 2325 and 2326 of the Revised Statutes of the United States. Section 2325 provides for the method of obtaining a patent where there are no adverse interests and no contest filed against the application. Section 2326 provides for the obtaining of a patent where there are adverse claims.

An adverse claim consists of some right, or alleged right, of a third

person to all or a portion of the property or claim, for which a patent is sought to be procured. It is any claim or holding adverse in interest to that which is claimed by the applicant.

The first step toward obtaining a patent is a survey of the mining claim by a deputy United States mineral surveyor under the direction and order of the surveyor general of the state or territory. After the survey is made and plat of the claim is completed the application for patent is made to the local land office, the statute requiring the publication of a notice of such application for a period of 60 days. Any one who desires to oppose the application for patent is required by the statute to file in the local land office where the application is made, within the time of publication of the notice, his adverse claim. As soon as the adverse claim is filed, the land office loses all jurisdiction to proceed with the application for patent until the question is decided by a court of competent jurisdiction as to who is entitled to the patent, except that the land office may take and file proof of the posting of the plat on the claim and the publication of the notice of the applicant for patent.

If there is no adverse claim filed in the land office prior to the expiration of the period of publication, the presumption is that no such adverse claim exists, and a patent will be issued upon final proof and payment of the statutory rate per acre for the land involved.

Adverse claims are only based upon surface conflicts. A prior applicant for patent to a particular piece of ground need not adverse a later application. The owner of a mining claim properly located prior to the application for a patent of the same land for townsite purposes need not adverse such application.

The adverse statute has no reference or application to cases where the party claiming adversely to the applicant for patent already has a grant or patent for the same ground, the adverse claim need not be in any particular form, but it must set forth facts, which, if true, would invalidate the applicant's right to a patent to the area in conflict.

With this adverse claim must be filed a plat made by a deputy United States mineral surveyor, showing the conflict or interference between the claims of the respective parties, but it has been held by the Supreme Court of Montana that where it is impossible to procure an actual survey and plat of an adverse claim, the adverse claimant may prepare a plat showing as nearly as possible from the means within his reach, the nature, extent, and boundaries of the conflict, and state the reason why a survey could not be had.

An adverse claim cannot be withdrawn for amendment, but there is nothing to prevent filing a second complete adverse claim if the first is deemed insufficient, at any time within the period of publication.

Under that statute of the United States the adverse claimant must begin a suit in a court of competent jurisdiction to determine who has the right to a patent to the ground in conflict. When he has instituted his suit for that purpose he can obtain a certificate from the clerk to that effect and file said certificate in the land office where said application for patent and adverse claim are filed.

The Nature of the Suit.

In Montana we have a statute which prescribes the nature of this suit—section 1322, Code of Civil Procedure. Since the passage of the act of Congress of 1882 the purpose of the suit is not only to determine which of the two claimants has the better right, but also to determine whether either has any right; and the courts must not construe the local statutes or provisions so strictly that these questions cannot be tried. The complaint should allege the title of the adverse claimant to the land in conflict; the filing of the adverse claim, and the commencement of the suit within 30 days thereafter, and set forth the proper description of the premises.

In my opinion it should also allege the citizenship of the adverse claimant, or that he has filed his declaration of intention, although many cases hold that this is not necessary. The answer need not contain a counterclaim if it shows that the defendant is entitled to the property.

As to the Proof.

It is not enough to show that one claim is better than the other. One must show a clear right to the property as well against the government as against the other party before he can prevail.

As to the Effect of the Judgment.

The statute provides that upon filing the judgment roll in the local land office the party found by such judgment to be entitled to the patent may procure such patent without further application or any other steps except the payment of the purchase price.

If the court finds that neither party to the suit is entitled to the ground in conflict it so certifies to the land office, and the land is again a portion of the public domain and is open to location.

Adverses and Special Conditions.

Under the provisions of section 2325, when no adverse is filed no objections from third persons to the issuances of the patent will be received except that it may be shown that the applicant has failed to comply with the terms of this chapter. Third persons may appear as a friend of the government and file a protest against the issuance of the patent. It gives the protestant no right to the land if decided against the applicant, but is simply allowed to put the government on its guard and prevent itself being defrauded. Its use is subject to the rules and regulations of the land office. It may be filed at any time before the patent actually issues, and the land department has full, complete and final jurisdiction over all questions raised by it. It is most frequently filed—first, when the character of the land is in dispute; second, where the claimant is attempting to defraud the government by claiming that he has complied with all the conditions required by the statute, when in truth and in fact he has not done so.

There are four other special conditions relative to quartz claims which require some consideration, to-wit: Cross veins, veins cutting on the dip, tunnel claims and rights, and extralateral rights. We will consider the first three in this connection, leaving the consideration of extralateral rights for the last lecture of the course.

Cross Veins.

Cross veins are those which intersect and cross each other, each thereafter continuing in its own direction.

The law governing cross veins is found in sections 2322 and 2336 of the revised statutes. The only provision in section 2322 affecting this question is that any locator, so long as he complies with the law of the United States, "shall have the exclusive right to possession and enjoyment of all the surface included within the lines of his location and of all veins, lodes and ledges throughout their entire dip, the apex or top of which lies inside of such surface lines extending downward vertically." Section 2336 provides that where veins cross each other priority of title shall govern and that the prior location shall be entitled to all ore or mineral contained within the space of intersection; but the subsequent location shall have a right of way through the space of intersection for the purpose of convenient working of the mine.

The only question is "Which location takes that part of the vein covered by both locations outside of the point of intersection of the vein; that part of the vein confessedly belonging to the senior location?" For many years the Colorado courts have held that the entire cross vein within the limits of the senior location, except the point of intersection, belonged to the junior claim. This doctrine seems to have resulted from the order of Judge Hallett in *Hall vs. Equator company*. The Arizona and California courts have always held that the senior location not only takes the cross vein at the point of intersection, but also the remainder of the cross vein within the limits of that vein. The Colorado supreme court has abandoned the earlier decisions and agrees with the Arizona and California doctrines. This same doctrine has been affirmed by the Supreme Court of the United States.

Veins Uniting on the Dip.

Section 2336 provides that "where two or more veins unite the oldest or prior location shall take the vein below the point of union, including all the space of intersection." This statute does not apply to the intersection of veins on the strike. The phrase "below the point of union" is said to have reference to the union of veins on the dip. In such case the statute is plain, and the older location takes the vein from the point of intersection and thence downward.

Section 2323 provides for these rights and determines the extent thereof. The revised statutes provide no method of locating a tunnel interest or claim, or of locating a quartz claim discovered in the course of a tunnel. The land office adopted a rule in 1873 furnishing a method of locating a tunnel site.

The statute provides that the failure to work in the tunnel for six months shall be considered an abandonment of the right to all undiscovered veins in the line of the tunnel. This would not forfeit all rights which attach to the tunnel so far as completed. The courts of Colorado and Montana have held that the line of the tunnel means only the width of the actual excavation, but this rule has been modified in both jurisdictions by later cases.

Many of the important questions arising under this section of the



PROPERTIES OF THE BEAR GULCH AND GOLD KING MINING COMPANIES, JARDINE, PARK COUNTY MONTANA

statute have been set at rest by the Supreme Court of the United States. The mooted question for many years was "How shall a quartz claim discovered in a tunnel be located and marked?" The Colorado courts and the Supreme Court of the United States hold that the location need not be marked upon the surface of the ground, but that a notice of what is claimed shall be posted at the mouth of the tunnel. Many courts of inferior jurisdiction, and many lawyers of eminent ability have held that the location of a vein discovered in a tunnel must be marked on the surface as any other location, and that the date of the surface location relates back to the date of the location of the tunnel site. This seems to be the opinion of Judge Lindley, sections 467 and 491.

The following difficulties suggest themselves as to Judge Lindley's theory:

a. The impossibility of marking the surface boundaries so as to surely include the apex of the vein.

b. Surface conflict of the location with other locations on known veins cropping out of the surface and properly locatable under other provisions of the statute.

c. The date when the surface marking should take place in order to be within the other provisions relating to completing the markings and making the proper record of the location.

d. The difficulty of certainly securing both the apex of the vein and the point of discovery within the limits of the claim.

Of course, if the patent is desired for a vein discovered in the course of a tunnel it must be marked on the surface, but no patent is necessary.

The Supreme Courts of Colorado and the United States have held that blind leads discovered while projecting a tunnel through a prior valid claim cannot be claimed to be a discovery in the tunnel, and that tunnel claims located solely for the purpose of discovery have no right of way through lodes which lie in their course.

The Supreme Court of Colorado has held in a late case that a vein discovered in a tunnel 250 feet beneath the surface may be located on the surface by simply projecting the course of the dip as disclosed in the tunnel to the surface and marking the boundaries of the claim from that point. It is well to remember, though, that in this case the tunnel in which the discovery was made was not located or claimed under the Statutes of the United States, but was commenced upon patented property belonging to another person and the work was done by his permission.

Placer Mine Procedure.

Placers were not included in the act of July 26, 1866, and were open to entry and sale by the act of July 9, 1870. Sections 2329, 2330 and 2331 cover the location and acquirement of patents to placer claims.

Definition:—By the term "placer claim" is meant ground within defined boundaries which contains mineral in its earth, sand or gravel. Alum, asphaltum, borax, diamonds, gypsum, kaolin, marble, mica, soda carbonates and nitrates, slate for roofing purposes, umber, and many other minerals must be recorded under the placer act.

The Different Minerals.

Building Stone:—By act of Congress, August 4, 1892, authority is given to enter lands chiefly valuable for building stone as placers.

Petroleum:—Under the act of February 11, 1897, Congress provided for the location, entry and patent of lands containing petroleum or other mineral oils, and chiefly valuable therefor, as placers. The courts have held that a discovery must be made of petroleum within the limits of the claim sought to be located, and that mere surface indications are insufficient to show that petroleum is found in adjoining lands.

Brick Clay:—The land department has universally disallowed patents to brick clay under the placer mining laws, and has always allowed patents for fire clay.

Tailings:—It is held in California and Nevada that if one abandons tailings from his mine or works, and they flow down stream and become deposited on lands of another, they belong to that other; and if they accumulate on appropriated public land it has been the custom to recognize the right of the first owner to appropriate them by proceedings analagous to the location of placer claims.

Subterranean Gravel Deposits in Ancient River Beds:—The courts of California have held such deposits locatable as placer claims. Other courts have held that claims almost identical with the one mentioned in the California case may be located as a vein in place.

Location:—The act of Congress provides no particular method of locating placers. It is left to the regulation of the land office and to local regulation, rules and customs. The land office rules provide that the general rules as to location, marking boundaries and records of quartz claims shall be followed.

The revised statutes do not in express terms require discovery as a prerequisite to location, and it has been held in California that none is necessary, but under the provisions of section 2319 I cannot see how the character of the ground can be determined in any other way than by discovery. The land department requires a discovery on each 20 acres of placer ground. The Supreme Court of Montana has held the contrary.

Posting Notices and Preliminary Development Work:—When required by local statutes, rules or customs, such requirements must be followed because they are a part of the act of location. Where no such requirements are made no notice need be posted on the premises, nor any preliminary work done except the discovery.

Under the Statutes of Montana the notice of location must be posted and certain development work done in order to complete the location. Section 3610, Political Code, laws of 1901, pages 140 and 141.

Surface Included.

One person may locate 20 acres. An association of persons, not less than eight, may locate 160 acres. If the land is surveyed the locations must conform to the surveys as nearly as practicable.

Marking the Boundaries:—There are no direct provisions of Congress

requiring the boundaries to be marked on the ground. The land office, however, requires such marking in the same manner as for quartz claims. See also laws of Montana, 1901, pages 140 and 141.

If the location is made on surveyed land and the entire subdivision is located, I see no occasion for marking the boundaries, as the government surveys would show the exact location of the claim. However, the courts of California hold that even under such circumstances the boundaries must be marked on the ground.

Record:—The Supreme Court of the Territory of Montana at an early date held that in the absence of local rules or legislation a placer claim need not be recorded. But under the present statutes of Montana the record is required in the same manner as in the location of quartz claims. Laws of Montana, 1901, pages 140 and 141.

Annual labor is required to hold placer as well as quartz claims.

Patents.

Patents are obtained to placer claims by the same process and proceedings as provided for quartz claims, except that where they conform to the public surveys there need be no survey or plat.

Another variation arises where the placer contains a lode claim. Under section 2333 if the placer claimant knows that a lode is situated within the limits of the placer, he must also apply for a patent to the lode claim with the application for the placer claim. In such proceeding the lode claim must be surveyed and the regular patent proceedings followed and the lode claim can only be 25 feet wide on each side of the vein. The lode and placer claims are patented together in one application.

Where a lode or claim is known to exist within the limits of the placer owner's claim and not included in the application for patent, all claim to it is waived, and it is open to location and appropriation by others.

If no vein is known within the limits of the placer, patent to the placer conveys all valuable deposits within its boundaries. It has been held that the fact that there was a known lode within 300 feet of the boundary of the placer was not evidence that there was a known lode in the placer, but a regularly located and recorded lode within the limits of the placer is a known lode even though the placer claimant had no knowledge of its existence. If a known lode exists it does not pass by the placer patent.

It has been held that to establish a standing exception from placer patents of known lodes, the lodes or veins must be clearly ascertained and be of such extent as to render the land more valuable on that account, and justify their exploitation at the time of the application for placer patent.

However, no location of a lode need be shown dating prior to the placer application if the vein is really known. The location of a placer claim does not prevent the location of a known lode within its limits by other parties.

Millsites.

Section 2337 provides for a patent of millsites in connection with a vein or lode, and also for the patent of millsites by the owner of a quartz mill or reduction works not owning a mine in connection therewith.

Location:—There is no provision in the Revised Statutes of the United States concerning the location of a millsite. The laws of Montana, however, provide for its location in this State. (Sec. 3610, Political Code.)

The land must be non-mineral in its character and not contiguous to a vein or lode. If it adjoins a lode claim on the end it is presumed to be mineral land, but this presumption may be overcome, and it does not exist where the millsite adjoins the side line of a location. It must be used for mining or milling purposes.

Patent:—A millsite used in connection with a lode may be patented with the lode. If not, it must be patented separately in precisely the same manner as a lode claim.

The Application.

Application is made for the lode and millsite together, but the application must be accompanied by an affidavit of its non-mineral character and proof of proper use by two disinterested witnesses. Also proof of occupancy for mining and milling purposes in connection with the lode or vein.

The plat and notices must be posted both on the lode claim and millsite, and it must contain a diagram of both. It is surveyed with and tied to the lode; the lode is usually designated as lot No. ———A, and the millsite as lot No. ———B. In making the entry no separate receipt or certificate is used, and they are covered by one patent, and the \$500 of improvements on the lode answers also for the millsite.

Extent:—It cannot consist of more than five acres. If properly located with a lode claim it would not pass under townsite patent, and if upon the application for a patent of the one the townsite patent is set up the millsite application would be recognized.

As to Patents on Millsite Aside From Lode:—The same proceedings must be taken in such cases as are taken for the patent of a lode claim. But quartz mills or reduction works must be shown to be owned before the entry can be made.

Patents From Possession:—Section 2332 provides for obtaining patents based upon mere possession, and it includes quartz claims, placer claims and millsites.

Statute of Limitations:—It has been claimed that by this section the statute of limitations of a state or territory where the claim is situated are recognized. I do not believe this section was ever intended to have such effect. The statute of limitations as to quartz claims cannot operate until the United States has released its interest in the property by patent.

Effect of Receiver's Receipt:—Receiver's receipt, so long as it remains uncanceled, is equivalent to a patent so far as the rights of third parties are concerned. In most of the states statutes have been passed providing for recording conveyances of real estate, and making the record thereof prima facie evidence of the title.

They are, however, subject to be canceled by the government at any time before the patent is actually issued.

Effect of Patent:—It has been held that from the issuance of the patent

a presumption arises that there has been a full compliance with all the mining laws relative to every act necessary to the procurement of the patent.

A patent when issued relates back to the date of the original location, and to the exclusion of all adverse intervening rights.

It is conclusive that there was a valid discovery and location and that all proceedings up to the issuance of the patent were regular as required by law, and that the land was mineral land.

The government may set aside a patent for misrepresentation, knowingly made by an applicant, as to the discovery of minerals or as to the form in which the minerals appear, whether in placers, veins, lodes, or ledges, but the burden of proof is upon the government to show fraud by clear and convincing proof. The report of a surveyor as to the sufficiency of the work performed and improvements made upon a mining claim to allow patent is conclusive upon the government after the issuance of patent.

Inspection:—In the State of Montana we have a statute authorizing the inspection of mines for the purpose of determining whether or not a trespass has been committed on a vein having its apex in another claim. (Secs. 1314, 1317, Code of Civil Procedure). This statute has been held constitutional by the Supreme Court of the United States. It is but declaratory of the exercise of jurisdiction by courts of equity which has been employed for over 100 years.

But the Supreme Court of Montana has lately held that section 1317 was only applicable to cases where the party seeking the inspection had an interest or title in the claim sought to be inspected.

Mining Partnerships:—Mining partnership is only a partnership *sub modo*, and the main difference between it and an ordinary partnership are those which flow from the fact that there is no *delectus personae*.

Historical.

It has been recognized under the English law for many years. The cause for its origin seems to have been the character of the business in which such co-partnerships engaged. The uncertainty of mining operations is such that comparatively a small number of persons are willing to chance their means in them. It is, therefore customary for persons to unite in the enterprise, each investing a portion of their capital only, and each taking such interest in the enterprise as he may desire or be able to pay for. Being impracticable for one member to work his interest in the common property separate from the others, it is worked by the owners jointly. This necessitates joint action throughout, which, from the nature of the operation, must be continuous in order to be successful. If the sale of his interest by either of the owners should dissolve the co-partnership, the work would stop until the co-partnership business could be settled up. So in case of the death or bankruptcy of either joint owner. This would be disastrous to any mining enterprise, and render the undertaking so uncertain and insecure that few would be willing to embark in it. To avoid this result it has become the established principle that the sale, death or bankruptcy of one joint owner does not dissolve the partnership, but that the purchaser or successor in

interest goes into the partnership and stands precisely in the place and stead of his predecessor in interest.

Delectus Personae:—New members are introduced into the partnership without the consent of the remaining partners by a sale, death, bankruptcy, or otherwise. There being no choice or consent, there is no presumption of confidence, and no trust relation exists, and no partner, manager, or superintendent can bind the partnership by his own act without authority.

How Formed:—It exists where several owners of a mine unite and co-operate in working the same, sharing the profits and losses. Its existence will be inferred from the acts of the parties and other circumstances. What is a mining partnership is a question of law, but its existence in a given case depends on the evidence.

Powers of Partners:—The law does not imply any authority either to a member of a partnership or to its managing agent to bind the company or its individual members by a promissory note or contract of indebtedness executed in the name of the company. The person claiming such liability must show the authority for contracting the indebtedness.

Control:—Those owning the major portion have power to decide what may be necessary and proper for carrying on the business, and to control the working of the claim where all parties cannot agree, provided the exercise of such power is necessary and proper for carrying on the enterprise for the benefit of all concerned.

Rights and Liens:—Each member has a lien upon the partnership property for debts due the creditors, and for money advanced by him for its use even in the absence of an agreement for such lien. Each partner has a right to sell and convey his interest to anyone at any time, and a failure to pay his share of the expenses for 90 days does not forfeit his interest.

Partnership Property:—Real estate purchased by the parties with partnership funds for partnership purposes is at law held by them as tenants in common, but in equity is held as a trust and as a part of the partnership property applicable in the first place to the payment of the partnership debts exclusively.

Dissolution:—The partnership is not dissolved by the death or bankruptcy of one of its members, nor by any sale or assignment of his interest.

The law of mining partnerships in Montana is covered by sections 3350 to 3359 of the Civil Code. This statute does not materially change the law of mining partnerships as above given.

Coal Lands.

The first coal land act was passed July 1, 1864, (13 Statutes at Large, 343). This was succeeded by the supplemental act of March 3, 1865 (13 Statutes at Large, 529).

Afterwards Congress passed a law which is incorporated in the revised statutes under sections 2347, 2348, 2349, 2350, 2351 and 2352.

Section 2347 provides that every person over the age of 21 years, who is a citizen of the United States, or who has declared his intention to become such, or any association of persons severally qualified, shall have the right

to enter by legal sub-division coal lands not exceeding 160 acres to such individual person, or 320 acres to such association, by paying \$10 per acre for such land where the same shall be situated more than 15 miles from any completed railroad, and not less than \$20 an acre for such lands as shall be within 15 miles of said road.

Preferential Rights of Purchaser:—Section 2348 provides that any person or association of persons severally qualified who has opened and improved, or who shall hereafter open and improve any coal mine or mines upon public lands, and shall be in actual possession of the same, shall be entitled to a preference right of entry when the land is surveyed, provided that when any association of not less than four persons shall have expended not less than \$5,000 in working and improving the mine, such association may enter not exceeding 640 acres.

Declaratory Statements:—Section 2349 provides that the claims must be presented to the register of the proper land office within 60 days after the date of actual possession and commencement of improvements thereon by filing a declaratory statement therefor, but when the township plat is not yet filed as the date of such improvement the filing must be made within 60 days after the receipt of the plat at the district land office.

One Person Shall Make But One Entry:—Section 2350 provides that only one entry by the same person or association of persons can be made, and that no association of persons, any member of which shall have taken the benefit of the statute, either as an individual or as a member of another association, shall enter or hold any lands under the provisions of the statute.

Conflicting Claims.

Section 2351 provides in case of conflicting claims priority of possession and improvement followed by proper filing and continued good faith shall determine the preference right to purchase.

Coal lands are mineral lands within the meaning of the general land laws which except mineral lands from entry thereon.

No discovery is required as in the mineral law, no staking of boundaries, no recording of certificates of location, but the land must be proven to be more valuable for its coal product than for any other purpose, and that the coal therein is in paying quantities, and is sufficiently valuable to be worked as a mine.

The fact that lands in the vicinity or even adjoining are shown to contain coal is insufficient to establish the character of a tract in which coal has not been developed, and the mere outcroppings or other surface indications in the absence of proof of the commercial value of the deposits will not prevent entry of the lands upon the pre-emption or homestead law. It is also held that the developments of coal in paying quantities on lands embraced within a homestead entry precludes the completion of that entry. But discovery after purchase on a commuted homestead entry will not defeat the issuance of patent.

In order to except the lands from the patents issued under the pre-emption and homestead acts there must at the time of the issuance of such

patents be known coal mines within the land capable of being profitably worked for their product and of such character as to make the land more valuable for coal mining than agriculture.

A corporation is an association of persons within the above statute, but it cannot acquire title to coal lands entered by its employes, agents and members for the use and benefit of the corporation when the corporation itself cannot make the entry because some of the members had exhausted their right. A location cannot be made by one for the benefit of another. All the members of an association must be citizens. The land department has formulated a set of rules and regulations construing and explaining all the provisions of the statutes and giving full directions as to the method of acquiring title thereunder.

Mining Claims and Townsites.

Sections 2380 to 2394, revised statutes, provide the method whereby public lands may be acquired for townsite purposes. Only sections 2386 and 2392, however, are important in this connection.

The law is well settled by the decisions of the Supreme Court of the United States as follows:

1. Where no application for patent has been made for a townsite the land is open to exploration, location and purchase under the mineral act the same as any other portion of the public domain, even though it is in the actual occupancy of persons for townsite purposes.

2. If a patent to the townsite has been issued, or final entry has been made, only such lands are excluded from the operation of such patent as were known to contain minerals of sufficient value to warrant exploitation and working at that time, and lands then located and possessed as mineral lands.

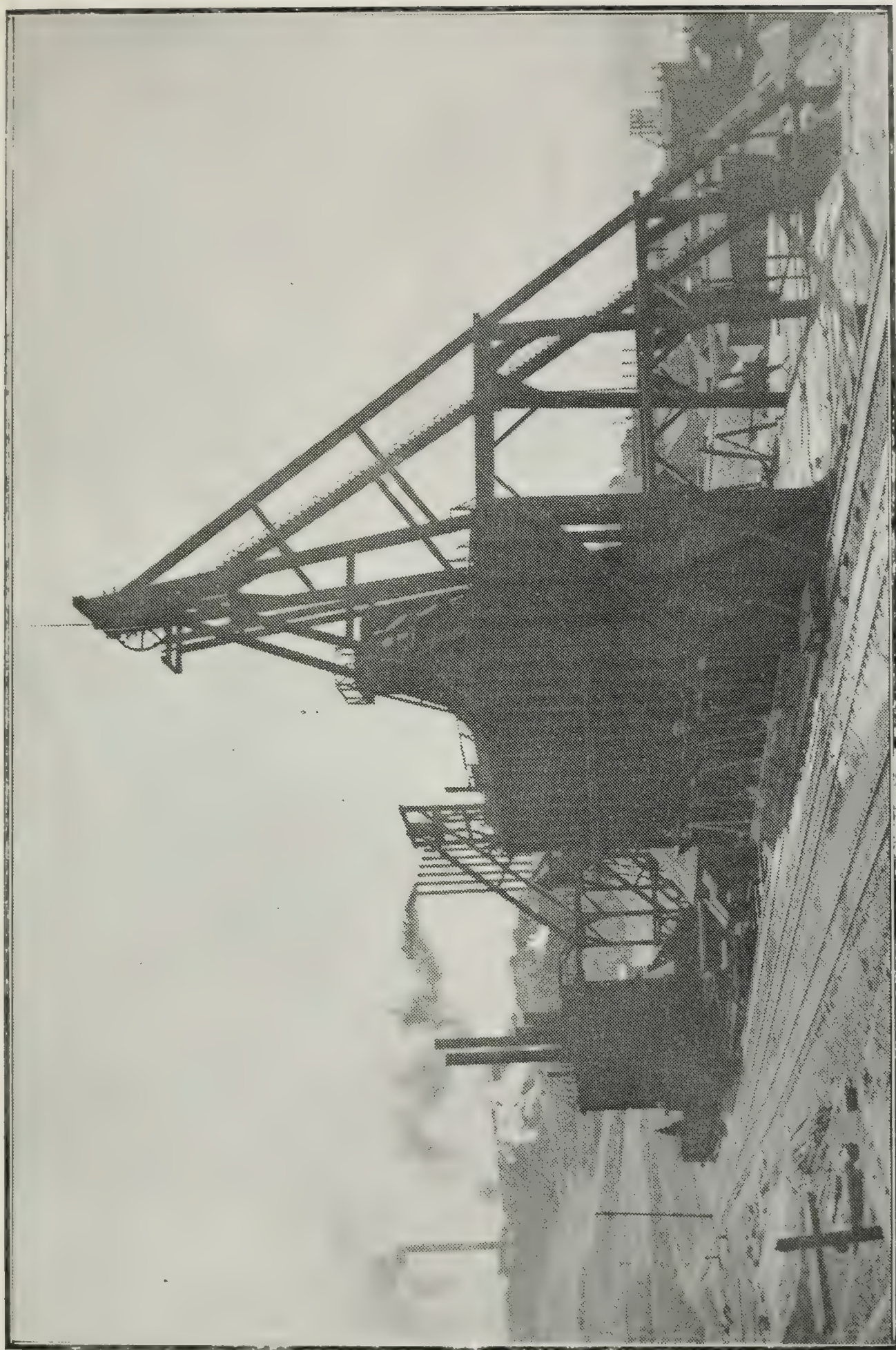
Mineral Claimant Protected.

Where a mining claim is actually located prior to the entry of the townsite for patent, the rights of the mineral claimant are protected. Townsite patent does not convey a millsite located with a lode claim prior to the townsite patent.

Conflicts Between Railroad Grants and Mineral Lands:—In all of the land grants given by Congress to railroad companies mineral lands are reserved. These grants are conveyances of lands in presenti, and while they are in the nature of floating grants until the line of the railroad is definitely located the grant then becomes anchored and relates back to the date of the grant. The title from the government passes as of that date by the grant, and no patents need issue except as a convenience for a muniment of title.

In the case of Northern Pacific Railroad Company vs. Cannon, the following doctrines are announced by the appellate court of this circuit.

Cannon located 160 acres of placer ground early in the seventies and procured a patent for it under the mineral act. The railroad company claimed that the land was not mineral in its character, and therefore passed by the grant to the company, and that the government having already granted the land prior to the issuance of the patent to Cannon, nothing passed by virtue



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of that patent. The definite line of the railroad had not been located until after the issuance of the patent. It was held:

Decisions of Law.

1. That the railroad company's definite location not having been filed when the patent was issued, this land never passed by the railroad grant.

2. That in issuing the patent the land department found that the land was mineral, and that the patent was conclusive in that regard so far as the company was concerned.

3. That if the company claimed any right when the patent was applied for it should have adversed the application.

4. That if any fraud was perpetrated it was a fraud upon the government, of which the government could alone take advantage.

In *Barden vs. Northern Pacific Railroad Company*, the Supreme Court of the United States held that all mineral lands were reserved from the grant, and that any discoveries of minerals before patent of the land to the company made that land mineral within the meaning of the reservation. That all lands not patented to the company were open for exploration, and that the character of the land could only be determined by proceedings upon the issuance of the patent.

Conflicts Between Locations Under the General Land Law and Mining Claims:—In cases of this character, unless the land was known to contain valuable mineral in such quantities as to warrant exploitation of it at the time of the sale for agricultural purposes, the grant under such sale passes all title to minerals within the boundary of the grant.

School and Mineral Lands.

Conflicts Between School Lands and Mineral Lands:—These lands passed by a direct grant to the State, and are not patented by the general government. By sections 2318 and 2319, Revised Statutes of the United States, a general reservation on lands valuable for minerals is made even in so-called school lands until the title passes from the government. The rule has always been that upon the admission of a new state Congress grants to such state for school purposes all sections 16 and 36 of the vacant lands of the government within the state. These grants are floating in their nature until surveys are made, but when surveys are made the grant becomes anchored and the title passes from the government and relates back to the date of the grant. So long as these surveys are not made the land is subject to location, because there is no method of ascertaining what lands will fall in these particular sections. After surveys are made no further locations can be made on the land.

Extralateral Mine Rights.

Prior to the enactment of the statute of 1872 these rights were known as "dip rights." Since 1872 these rights are provided for and governed by the provisions of section 2322, Revised Statutes of the United States.

Definition Extralateral Rights:—An extralateral right is the right of one having the apex of a vein within the surface boundaries of his location to follow the vein on its dip beyond vertical planes dropped downward through the boundary of his claim toward which the vein dips.

Extent of Right:—This right extends to the uttermost depth of the vein unless cut off by the interference of extralateral rights belonging to a prior location. They are bounded on the cross or strike of the vein by vertical planes dropped downward through the end lines of the location and continued in their own direction until they intersect the exterior portions of the vein. No vein can be followed on its course or strike after it departs from the boundaries of the claim.

Dip:—The dip of a vein is its departure from the perpendicular on its descent into the earth.

Course or Strike:—The course or strike of a vein is the length of the vein and is always at right angles to the dip.

End Lines:—End lines are those which cross the vein on its course or strike and measure the width of the claim.

Side Lines:—Side lines are those which run parallel with the vein on its course and measure the length of the claim.

Basis of the Right:—Extralateral rights depend upon the ownership of the apex of the vein.

Apex:—The apex of the vein is the top of the vein on its strike through the claim.

Principles:—Three principles have been established by the Supreme Court of the United States which must always be considered in the determination of extralateral rights, as follows:

1. The end lines of a location must be parallel to each other in order that any extralateral rights should exist.
2. The end lines must be straight.
3. The same set of end lines must bound the extralateral rights of veins having their apices within the limits of the claim.

Laws Compared.

The law of 1866 differs from the law of 1872 in three particulars.

1. Under the law of 1866 only one vein can be claimed or patented, while under the law of 1872 the locator was entitled to call all veins having their apices within the limits of the claim.

2. The amount of surface ground which could be included in a claim or patent under the law of 1866 was fixed by local rules or customs of miners and in the absence of such rules only so much surface could be claimed as was reasonably necessary or convenient for the working of the claim. Under the law of 1872 one may claim 1,500 by 600 feet of surface ground.

3. There was no provision in the law of 1866 that the end lines should be parallel. But the court says that they are inferred because of the impossibility of locating any claim without lines bounding the extent thereof on the strike of the vein. Under the law of 1872 the end lines of a claim must be parallel in order to give any extralateral rights.

Questions Arise.

• Conditions under which questions of extralateral rights may arise:—Where the vein on its course or strike crosses:

1. Both end lines of a claim which are parallel to each other.

2. Both end lines of a claim which converge toward each other in the direction of the dip of the vein.

3. Both end lines of a claim which diverge from each other in the direction of the dip of the vein.

4. Both side lines of a claim which are parallel to each other.

5. Both side lines of a claim which converge toward each other in the direction of the dip of the vein.

6. Both side lines of a claim which diverge from each other in the direction of the dip of the vein.

7. One end line and one side line of the claim.

8. The same end line or side line of a claim twice.

9. When the apex of a vein is split by a boundary line or where the vein is wider than the location.

I. Parallel End Lines:—Section 2322 gives the right to follow the vein on its dip in clear, concise and plain language.

II. Converging End Lines:—Under the law of 1866 the extralateral rights on a vein in this class would be bounded by planes dropped downward through the end lines of the claim and projected in their own direction until they intersected the exterior portions of the vein and so continued until they met. This because the statute did not require the end lines to be parallel.

Under the law of 1872 my judgment is that no extralateral rights would attach to a vein under these conditions because the end lines must be parallel. However, one decision has allowed extralateral rights in a case of this kind under the law of 1872 on the theory that the amount of the vein on its dip would be less than the owner had apex of the vein within his location.

III. Diverging End Lines:—Under the law of 1866 two theories have been advanced:

(a). That one has extralateral rights bounded by planes dropped downward through the end lines of the location and extended in their own direction as above stated. This theory is based upon the proposition that the law of 1866 gave extralateral rights and did not limit them to that part of the vein between parallel planes.

(b). That the extralateral rights must be limited to that part of the vein lying between the parallel planes dropped downward through the point where the vein crosses each end line and at right angles to the general course of the vein.

This theory is based upon the proposition that the courts have held that the Statutes of the United States contemplates that one should have no more of the vein on its dip than he has apex in his location.

I. Parallel Side Lines:—The law is the same with reference to this condition under both the statute of 1866 and 1872.

The Supreme Court of the United States has held that under such circumstances the side lines of the claim become end lines for the purpose of bounding and defining extralateral rights. These decisions are based on the theory that a location of a claim should be laid along the course of

the vein and not across it, and therefore the lines crossing the vein are really end lines of the claim, although the locator called them side lines.

V. and VI. **Converging and Diverging Side Lines:**—Under the act of 1866 the same rule as to extralateral rights would apply as stated in reference to conditions two and three because the side lines of the location as marked upon the ground would become the end lines thereof for the purpose of defining extralateral rights.

Under the act of 1872, in my judgment, no extralateral rights would exist because the end lines as fixed by the court, are not parallel.

Court Decisions on Side and End Lines Elucidated.

There have been no decisions by the Supreme Court of the United States where this condition has been considered with reference to a location made under the act of 1866. I see no reason why such conditions may not arise, and I believe that the law as settled with reference to locations made under the act of 1872 would equally apply to locations made and patented under the act of 1866.

Doubts:—For a good many years after this condition was presented the law was unsettled whether or not any extralateral rights attached. It was generally believed that they did not exist. This belief was based upon two propositions which, it was thought, had been definitely settled by the Supreme Court of the United States. They are as follows:

- (a) Any line of a location which was crossed by a vein on its strike or course was an end line for the purpose of determining extralateral rights.
- (b) End lines must be parallel or no extralateral rights exist.

Confines of Veins.

The utter impossibility of having the lines crossed by the vein on its course parallel to each other under these conditions was thought to prevent the existence of extralateral rights. The Supreme Court of the United States, after a long time, finally decided that extralateral rights did exist with the following boundary planes dropped perpendicularly through the vein in its course, viz: The plane of the end line through which the vein crossed. Another vein dropped through the point of the vein's departure from the claim parallel with the end line through which the vein entered the claim.

The Same End Line or Side Line Twice:—There has never been any adjudication by the Supreme Court of the United States upon this condition. The Supreme Court of Colorado holds that no extralateral rights existed under such circumstances. The court of appeals of the Ninth circuit has held that extralateral rights do exist and that they are bounded by planes parallel to the end lines of the claim dropped downward through the points where the vein enters and departs through the side lines.

I think the doctrine of the federal court will be eventually recognized by the Supreme Court of the United States. The case in which the federal court decided this question has been appealed to the Supreme Court of the United States and has been argued before that court and a decision will probably soon be rendered.

Where the Apex of a Vein is Split by a Boundary Line of Location:—Two theories have been advanced with reference to this condition:

(a). That a claim having only a portion of the apex of the vein can have no extralateral rights.

(b). That the prior location takes the extralateral rights to the entire vein.

I find no direct adjudication under the first theory, but Judge Lindley adopts it in his work on mining law.

The Supreme Court of the United States in case of *Argentine Company vs. Terrible Company*, 122 U. S., 478, is held to be an authority for the doctrine announced under the second theory, and I believe the second theory states the law.

The Identity of the Vein or Lode:—In order to be entitled to follow the vein or lode on its dip beyond the boundaries of the claim the proof must show that it is the same vein, continuous, and in place. It must be continuous only in the sense that it can be traced.

Concerning the Dip.

Limits of Extralateral Rights Caused by Conflicts on the Dip with Prior Rights:—If a vein on its dip passes into a prior agricultural grant, the vein cannot be followed into said grant. The State court of Nevada has held the contrary doctrine, but the case has not yet been reported.

But if the vein on its dip passes into a prior patented mining claim it may be followed.

Where there is a conflict between two or more adjoining locations on the dip of the same vein the priority of location controls.

Where a broad lead on its course crosses from one location into another over a side line at such an angle that for a distance a portion of the apex is in each claim, the senior location takes the entire apex and the entire extralateral right, while any part of the vein is in its boundaries.

Rights to the Vein on the Dip Where the Apex is Entirely in Located Claims, But Because of the Divergence of Their End Lines a Portion of the Dip is Unoccupied:—There are three classes of decisions upon a condition of this sort:

Some Decisions.

1. That such portions of the vein on the dip may be divided between the adjoining locators who own the apex.

2. That the owner of the surface under which this part of the vein lies owns the vein under his common-law rights.

3. That one may locate a claim 1,500 by 600 feet and place his stakes upon the prior locations, and by such location the owner acquires all the rights both surface and extralateral as against the government and subsequent locators and he may follow the vein on its downward course between the planes of his own end lines in all respects as though there were no prior locations, except where it would conflict with the rights of the senior claim.

Extralateral Rights to Incidental Veins:—These rights are identical with the rights above considered as to the located vein, except that they are limited by vertical planes dropped downward through the end lines of the claim. Therefore, when the incidental vein is a cross vein, or one which crosses the claim, no extralateral rights can attach to it at all. The boundaries of extralateral rights may be fixed by conveyance or contract.

COAL STATISTICS.

ANALYSIS OF TABLES FOR 1900.

During the year 1900 there were mined in Montana 1,697,349 tons of coal, valued at \$2,377,669. Of this amount 133,651 tons were used for coke, produced 54,692 tons of the latter commodity, a consumption of 2.44 tons of coal to produce one ton of coke. Twenty-one mines reported and in this number all the important mines in the State are included. In 1895 only 12 concerns reported. With this circumstance in view there is an indicated increase of 539,627 tons. It is apparent, however, from data at hand, that the year 1895 should be credited with 1,504,193 tons, which reduces the above mentioned increase to 193,156 tons, a most probable statistical condition. In 1900 the value of the product was \$2,377,669 as against a value of \$2,850,906 for 1895, a decrease of \$473,237. The average value per ton for 1900 was \$1.40 as compared with \$1.89 in 1895, a decrease of 49 cents per ton. This decreased cost in the production of coal is no doubt mainly attributable to the use of machines.

The amount of coke produced in 1900 was 54,692 tons as against 61,378 in 1895, a decrease of 6,686 tons. It may be said that this decrease is owing to causes other than lack of market, for it is commonly known that the demand has been greater than the supply during the past several years.

The amount invested in the acquisition, development, and for buildings and machinery in the 21 reporting mines is \$5,890,500 as compared with \$2,265,300 reported by 10 plants for the year 1895.

The amount paid for labor by the 21 reporting plants was \$1,748,150.52 as compared with \$1,248,097 for the 12 plants reporting in 1895.

Montana is one of the 23 states whose output in 1900 was the largest in the history of the State. The year of previous largest production was in 1897, when the product was within 94,112 tons of the output in 1900. According to the tables of the United States Geological Survey, Montana produces 12.40 per cent of all the coal that is mined in the Rocky Mountain Division, this division comprising the states of North Dakota, Montana, Wyoming, Utah, Colorado, New Mexico, Idaho and Nevada. Also, Montana produces 61.44 per cent as much coal as the Pacific Coast Division composed of the states of California, Oregon and Washington. The states of the Rocky Mountain and Pacific Coast Divisions that produced a greater tonnage than Montana were Wyoming, Colorado and Washington.

The United States Geological Survey also makes a report as to the use of machines used in coal mining in the course of which it says that one of the most interesting features connected with the industry in Montana was the large percentage of product which was obtained by machines. In this report Montana leads among all the coal producing states. In 1900 63 per

cent of the total product was mined by the use of machines as against 56.4 per cent in 1899 and 46 per cent in 1898, the number of machines in use increasing from 62 in 1898 to 75 in 1899 and to 81 in 1900. The machine mined product during the same years, respectively, was 681,613, 843,710 and 1,015,115 tons. Pick or puncher machines seem to be in greater favor in the State than the chain breast machines, as out of the 81 machines in use in 1900 69 were of the pick or puncher pattern to 12 chain machines.

PRODUCTION OF COAL AND COKE, YEAR ENDED DECEMBER 31, 1900.

COUNTIES	Capital Invested..	Amount Paid for Labor	Tons of Coal Sold (Including to Em- ployes)	Tons of Coal Used for Coke.....	Tons of Coal Used at Mine.....	Total Production..	Total Value at Mine of All Coal Produced	Tons of Coke Pro- duced	Value of Same at Ovens	No. of Ovens in Operation.....	No. of Days Ovens Were Operated During the Year.
Carbon	2,400,000	\$ 479,851 09	393,983	.....	5,935	399,918	511,610	17,517	.....	.....	.....
Cascade	1,468,500	955,954 25	1,044,135	59,176	43,223	1,146,534	1,541,263	.....	\$ 2,634 07	10	29
Choteau	7,500	5,800 00	5,137	.....	6 0	5,757	14,507	.....	.....	.....	.....
Custer	2,500	2,100 00	2,900	.....	10	3,000	4,500	.....	.....	.....	.....
Pergus	12,000	10,910 00	8,700	.....	1,90	9,990	23,507	.....	.....	.....	.....
Gallatin	350,000	58,895 60	26,480	.....	895	27,375	46,537	.....	.....	.....	.....
Park	1,650,000	234,639 58	4,700	74,475	25,000	104,775	235,745	37,175	236,177 00	128	210
Total	\$5,590,500	1,748,150 52	1,436,035	133,651	77,663	1,697,349	2,377,669	54,692	\$318,871 07	228	499

PRODUCTION OF COAL AND COKE, YEAR ENDED DECEMBER 31, 1901.

COUNTIES	Capital Invested..	Amount Paid for Labor.....	Tons of Coal Sold (Including to Em- ployes).....	Tons of Coal Used for Coke.....	Tons of Coal Used at Mine.....	Total Production..	Total Value at Mine of All Coal Produced	Tons of Coke Pro- duced	Value of Coke at Ovens	No. of Ovens in Operation.....	No. of Days Ovens Were Operated During the Year.
Carbon.....	2,900,500	553,954	479,291	.....	12,805	492,096	616,410	.....	.....	.....	.....
Cascade	963,000	758,443	726,205	37,813	27,565	791,764	1,148,266	18,488	105,919	10	27
Choteau	9,100	8,120	3,685	.....	25	3,711	8,550	.....	.....	.....	.....
Pergus	27,600	14,840	7,435	.....	.....	7,435	21,255	.....	.....	.....	.....
Gallatin	110,000	60,241	32,153	.....	1,070	23,223	56,968	.....	.....	.....	.....
Park.....	950,000	208,583	3,344	65,137	48,916	117,427	352,281	38,516	250,374	128	330
Custer, Dawson, Granite, Lewis and Clarke and Meagher	9,600	6,085	6,913	.....	.....	6,913	13,564	.....	.....	.....	.....
Total	\$4,979,800	\$1,610,266	1,259,026	\$102,950	\$90,412	1,412,569	2,217,294	57,004	356,273	228	537

ANALYSIS OF TABLES FOR 1901.

Thirty-six properties in Montana produced 1,442,569 tons of coal during the year 1901. It may here be said, however, that the majority of these properties are not more than prospects from which lignite is mined in a desultory way merely to supply a limited local demand. Eight mines produced 1,397,736 tons of the total amount, leaving the balance of 44,833 tons to be distributed among the 28 small properties. This is a decrease of 254,780 tons under the year 1900, which is in part accounted for by the opening of coal mines just across the line in Canada which are now large shippers into Montana for the use of the Great Northern Railway and the practical abandonment of the Sand Coulee mines, which have hitherto been the chief supply for this road in Montana. These mines have produced over 5,000,000 tons of coal in the last 18 years. Something like 150,000 tons of coal were imported from Canada during the year. In consequence of the closing of the Sand Coulee mines there was a falling off of 354,770 tons in Cascade county. Carbon, more than any other county, has partially equalized this loss by an increased production over 1900 of 92,178 tons. Montana is one of five states to show a decreased output as compared with 1900. The Bureau's report of total production exceeds the figures of the United States Geological Survey 46,488 tons for 1901 and 35,574 tons for 1900.

57,004 tons of that product, a consumption of 1.81 tons of coal for one ton coke as against 2.44 tons of coal used in the same process in 1900. The increase in the coke output over the former year was 2,312 tons, the number of ovens in operation being 228, the same as during 1900.

The amount paid to labor was \$1,610,266, being \$137,884 decrease. This would indicate that \$1.12 per ton was paid for mining coal, but the amount paid to labor includes all employes that appear on the payrolls of each concern, some of whom are not inside the mine at all; and again, the amount paid to miners and others who are engaged in development and other dead work is included, and is quite large, but not ascertainable to a degree of certainty that would justify an announcement.

GEOLOGY OF MONTANA COAL FIELDS.

For a geological synopsis of the coal fields of Montana the Bureau is indebted to the United States Geological Survey which in 1902 published a bulletin prepared by Mr. L. S. Storrs upon the subject of the "Rocky Mountain Coal Fields." Mr. Storrs says:

The coal-bearing formations of this State have a greater range in the geologic scale than elsewhere in the Rocky Mountain region. This range is from the Jurassic to the Tertiary, although most of the coal is of Cretaceous age. There is a small area of Jurassic rocks which contains one seam of coal. This is not, however, of workable thickness, and the occurrence is of interest only as indicating the beginning of conditions favorable to the formation of coal during that period. The formations containing valuable coal deposits occupy the entire range of the Cretaceous, coal being found in Cascade formation, at a lower horizon than in any of the fields south of Montana.

As in Wyoming, the plains region to the east of the Rocky Mountains,



VIEW OF THE TOWN OF STOCKETT AND THE PLANT OF THE COTTONWOOD COAL COMPANY

extending into the Dakotas, is underlain by beds of lignitic coal of varying quality. Westward from the plains the coal gradually changes in character. The beds adjacent to the outlying spurs contain a higher grade of lignitic coal, while in those along the base of the main range are found bituminous and coking coals.

The coal fields of Montana form a nearly continuous belt extending in a northwest-southeast direction entirely across the State. Very little detailed investigation has been made in most of these fields, however, and hence only a general idea can be given of their value. Only in a few of the fields are data as to the number of coal beds obtainable. Generally the coal beds are extremely variable, and the gradation from coal to shale is very abrupt, while the coal is sometimes entirely cut out by a bed of sandstone.

Bull Mountain Field.

The productive measures of this field, which are probably Fort Union, lie above the formations of the surrounding plains. The underlying Laramie also contains several beds of workable thickness, though the coal is not equal in quality to that found in the higher formation. The field lies about 45 miles northeast of the town of Billings and an equal distance from the Northern Pacific Railway.

The outcrop of the only workable coal bed outlines an elliptical area of 55 square miles, all of which contains workable coal. Extensive prospecting along the outcrop around the entire field has demonstrated the evenness of the strata, their inclination at no point being greater than six degrees. The center of the basin is located a little west of the center of the field.

On the east-west axis through the center of the field the bed acquired its greatest thickness of 16 feet of clean coal, thinning down to 10 feet at the extreme western end. In the eastern portion of the field there is about the same thickness of coal, but a band of sandstone, only a few inches in thickness through the greater part of the field, separates the seam into two benches, the sandstone acquiring a maximum thickness of 50 feet.

The coal is lignitic in character, but, as shown by analyses, is of a much higher grade than that in the underlying formations. Only a small quantity of coal is now mined in this field as the country is almost entirely a cattle and sheep range.

Clark's Fork Field.

The Bighorn Mountain uplift has brought the Laramie to the surface along its western side, forming the Clark's Fork field. It crosses the Yellowstone river 22 miles west of Billings and extends thence north to the Musselshell river. The northward extension of the field is not known to contain coal beds of value. At a point about eight miles south of the Yellowstone river the beds acquire a workable thickness, which is maintained southward into the Bighorn basin field of Wyoming.

The coal occupies the bottom of the Laramie formation, the "basal sandstone" being exposed but 10 feet below the lowest bed, while the bed now worked is 50 feet above. The inclination of the beds average about five degrees toward the west.

The bed which is mined varies in thickness from five feet at the northern end of the workable area to three feet about six miles south of this point, and again increases to nearly five feet within the next 15 miles.

There are two other beds at this point, one immediately above the bottom of the Laramie and another about 500 feet higher. Neither of these beds has developed a workable thickness at any of the points where they have been opened.

The coal is lignitic, but has a peculiar structure. Bands of bright coal alternate with bands having a dead appearance and closely resembling bony coal. The proportion of the latter gradually increases toward the north, where they become shale lenses, so that the product is of little value. Toward the south the coal is very bright and quite pure.

The field is reached by a branch of the Northern Pacific Railway, the principal market for the product being the mines and smelters of Butte and vicinity.

Rocky Fork Field.

This field is situated only about three miles west of the Clark's Fork field. The coal-bearing rocks are immediately above the Laramie strata and probably belong to the Fort Union. The field lies at the base of the Beartooth Mountains, around which the carboniferous limestones are almost vertical. The coal-bearing strata dip west toward the mountains, at an angle of about four degrees. The strata at the northern border of the field are much more steeply inclined, the dip being 21 degrees to the south. The slope of the only producing mine in the field is driven south from this northern border and the strata flattened rapidly in this direction, soon assuming the normal westerly dip. The field is about six miles in length north and south, and extends eastward five miles from the limiting limestones of the western border.

There are five coal beds of workable thickness throughout the field. The following is an average section:

	Feet. Inches.	
Bed No. 1	5	3
Intervening shales, clays and soft sand-		
stones	71	0
Bed No. 2	4	11
Intervening strata	58	0
Bed No. 3	7	9
Intervening strata	40	0
Bed No. 4	4	0
Intervening strata	70	0
Bed No. 5.....	5	0

The coal is very similar in character to that of the Canyon City field in Colorado; it is of a transitional type between bituminous coal and lignite, making an excellent steam and domestic fuel. The only mine operated in this field is that at Red Lodge, owned by the Northern Pacific Railway Company, a large part of the supply for their locomotives being taken from this mine.

It is probable that a connecting field will be discovered in the rough

country at the base of the mountains between this field and the one located 60 miles toward the northwest, on the Boulder river.

Yellowstone Field.

The outcrop of the coal-bearing formations can be followed 150 miles from the extreme eastern end on the Boulder river through the Boulder, Livingston-Bozeman, Sixteen Mile, and Shields river basins, thence circling around the northern and eastern end of the Crazy Mountains and connecting with the western end of the plains field.

The Boulder district comprises the area of Laramie along the drainage of the West Boulder, extending thence west as far as the Yellowstone river at Livingston. The area covered by the coal measures is 30 miles in length east and west, and from 5 to 18 miles in breadth. This northern border of the field is formed by the edge of the overlying Livingston formation. The strata dip north, away from the Boulder Mountains, from 12 degrees to 45 degrees.

Only one coal bed has as yet been discovered in this field. This has a maximum thickness of four feet at the eastern end, on the West Boulder river. The coal cokes, and, although it has never been tested on a large scale, laboratory tests indicate that it is a high-grade fuel.

The Livingston-Bozeman District.

The Livingston-Bozeman district consists of the continuation of the Boulder district from the Yellowstone river westward.

The coal-bearing formations outcrop along the northern base of the mountains westward to the Gallatin range, and their outcrops swing northward along the eastern base of the Gallatin and Bridger ranges. This district contains the maximum thickness of coal in the entire field, and is the only portion in which actual mining is now going on.

The strike of the beds follows very closely parallel to the neighboring mountains, the dip being everywhere away from them. Numerous minor fault planes occur where the strike of the beds makes an abrupt change in direction, and the dislocation of the strata has been further increased by the subsequent intrusion of igneous rocks.

Four coal beds have been discovered in this field, one of which never attains workable thickness. As a rule, only one bed is productive at any one point, the others having pinched down below the limit of profitable mining. The beds are composed of alternating bands of coal, bony coal, bone, and shale in varying proportions, and the gradation from one to the other is very abrupt. In several instances which have come under the observation of the writer a band of coal containing but 5 per cent of ash has changed in a distance of but 50 feet along the strike to material containing as high as 40 per cent of ash. The beds vary from 4 to 16 feet in thickness where mined, the dip varying from 25 degrees to 90 degrees. The only practicable method of mining consists in taking out the entire bed and passing it through a washer, the resulting product being a high grade of steam and coking coal.

There are at present two operating mines in this district, one of which has just been opened.

A large proportion of the output is consumed for locomotive fuel on the Northern Pacific Railway, the main line of which crosses the western end of the district.

The Sixteen Mile Creek and Shields River Districts.

The Sixteen Mile creek and Shields river districts extend northward 40 miles from the line of the Northern Pacific Railway, to the northern end of the Crazy Mountains. From this point they extend westward 45 miles, around the northern end of the Bridger range. Along the many miles of Laramie outcrops thus exposed the coal has been prospected by a series of open cuts, which have failed to show any thickening sufficient to warrant the opening of mines and the extension of the railroad. The Cascade formation is present over a small portion of the western part of this area, and one coal bed has been found a short distance above the base of the measures, but not of a workable thickness.

This great area of coal-bearing rocks offers a promising field for detailing prospecting, and coal, if found in workable thickness, will be especially valuable by reason of its proximity to the large mines and smelters of Butte and Helena.

Trail Creek Field.

This area consists of a small synclinal basin of the Laramie, situated nine miles south of the Northern Pacific main line at Mountain Side, and separated by only half a mile from the Yellowstone field. At the eastern edge of the field the strata are overturned along the base of a high ridge of carboniferous rocks, from which it extends westward four miles, to the base of a ridge formed by an eruptive overflow from the Gallatin range. It extends north and south along the valley of Trail creek about nine miles.

There are three coal beds of workable thickness throughout the northern end of the field, where there are two operating mines, in which the coal has a thickness of 4 to 12 feet.

The coal is entirely different in character from that of the Yellowstone field. It yields a large proportion of lump coal, and is semi-bituminous, being chiefly valuable for domestic use, while fine coal chiefly is produced at Chestnut and Mountain Side.

The production in 1900 was small, the mines having been connected with the railroad during that year.

Cinnabar Field.

This field extends northward from the northern border of the Yellowstone National Park, on either side of the Yellowstone river. The portion of the field on the east side of the river probably contains no workable coal. The main portion of the field occupies the high land extending north from Electric Peak, and is 1,500 feet above the valley of the river. The coal is conveyed to the coke ovens in this valley by a long flume.

That portion of the field in which mining is now carried on consists of a series of faulted blocks, in which the beds through the southern end of the field are nearly horizontal. The field extends from the high bluffs overlooking the Yellowstone westward three miles to the deeply eroded

valley of Cinnabar creek. Along the northern border the strata are steeply upturned against the base of Cinnabar Mountain.

There are four coal beds in the main portion of the field, all of which are of workable thickness, the thickest being five and one-half feet. The coal has all been highly altered by the eruptive rocks of Electric Peak, several intrusive sheets from which have invaded the coal-bearing rocks. The coal from three of the beds makes a good grade of coke, that of the other bed being semi-anthracite, very hard, and having the characteristic luster and cleavage of anthracite.

There is but one mine operated in the field, a part of its product being converted into coke. The plant has been considerably enlarged during the last year, and its capacity is at present much larger than in 1900. The field is reached by the Park branch of the Northern Pacific Railway.

West Gallatin Field.

Along the headwaters of the West Gallatin river and between the Gallatin and Madison ranges there are several isolated areas of the Laramie formation. Their location, however, is so remote that little attention has hitherto been given to the coal.

The only one of the several areas in which coal of value has been found is on Taylor's Fork of the West Gallatin, 75 miles from the Northern Pacific at Bozeman. This area occupies the high divide between the West Gallatin and Madison rivers. It forms a synclinal basin six miles across, with dips on the northern margin of 20 degrees and on the southern margin of six degrees.

There are three coal beds in this field, ranging from four to six feet in thickness. The character of the coal is still in doubt, as none of the development work has exposed any of the beds to a sufficient depth to get beyond the effects of weathering. At some points one of the beds shows a pronounced coking quality, which is probably the character of the coal throughout the area. The other areas in this region offer promising fields for detailed prospecting. Owing to the proximity of large bodies of eruptive rock, the coals will doubtless be found highly altered. These areas are located on the West Fork of the West Gallatin and immediately north of the Sphinx Mountain.

Ruby Valley Field.

This field is located 30 miles west of the Gallatin field, and has received even less attention than the latter. The rocks are of Laramie age, and do not present any indication of serious disturbance. The only prospecting done in this field consists of a series of open cuts along the outcrop. These have as yet failed to develop beds of workable thickness.

Toston Area.

There is an isolated area containing six square miles of the Cascade formation three miles south of the town of Toston and crossed by the main line of the Northern Pacific. The strata are badly broken and the field is so small that the erection of a large mining plant would not be warranted. The field could doubtless be operated with profit on a small scale, especially

as the coal is coking. There are portions of the bed in which the coal has been altered beyond the coking stage and is essentially graphite.

Smith River Area.

This area lies along the high divide east of the Smith river. It is so remote from transportation that no attention has been given to its development, and there is no information obtainable regarding the coal which it may contain.

Belt Field.

This field lies along the northern base of the Little Belt Mountains and their westward extension on the west side of the Missouri river, extending westward 125 miles from the Judith river. The country underlain by the coal is so deeply covered with glacial drift that the strata are exposed only along the canon walls. The field is a narrow belt extending along the base of the mountains, its strata having a slight dip toward the north, away from the range. This is the only considerable occurrence in the United States of the Kootenai formation of the Canadian coal fields. This formation has been named the Cascade by Mr. Weed. The only coal bed of workable thickness is near the center of the formation. The thickest point seems to be in the vicinity of the mines at Sand Coulee. Northward from this point the bed thins out, while toward the west it splits into two benches separated by a bed of shale reaching a thickness of 25 feet. At Sand Coulee the coal is seven and one-half feet in thickness, with three small shale partings. The coal from the various bands is quite different in character, that from the bottom being coking and containing the smallest amount of ash, while that from the other two benches does not exhibit any tendency to coke, but makes an excellent steam fuel. The only objectionable feature is the excessive amount of ash contained in the middle bench. Near the mouth of Smith river and on Hound creek the bed is between five and six feet in thickness.

The extension of this field west of the Missouri river has never been thoroughly prospected. At some points the coal shows a workable thickness along the outcrop, and future prospecting will doubtless develop a valuable productive area. The coal has been opened at a number of places in the eastward extension of the field through the Judith Basin. The fuel for the town of Lewistown is obtained from mines at the base of the Judith Mountains.

The output of these mines is used in their immediate vicinity, since this part of the field has no railroad connection. The mines of the Great Falls district are on a branch of the Great Northern Railway. Their output is largely coked in the ovens at Belt.

Sweetgrass Hills Field.

This field is located on the eastern slope of the foothills of the Rocky Mountains, in the extreme northern portion of Montana. The coal occurs in the Belly river formation, which extends south from Canada. But little development has been done in this field and there are no producing mines. There are three coal beds of workable thickness exposed which are capable of yielding a fair grade of semi-bituminous steam coal.

Areas of the Lake Beds.

Along the summit of the main Rocky Mountain range and westward there are numerous areas of Neocene lake beds which contain some lignitic coal. None of these areas have as yet developed any coal of value.

The rocks of some of these areas were deposited in basins in the granite, and others upon more recent beds. They form a series of isolated basins distributed over a region which extends westward 90 miles from the Continental Divide and southward into Idaho. They are probably to be correlated with the areas at the base of the Boise Mountains. There are several points at which these lake beds have been subjected to the influence of the later eruptions, and further prospecting may develop coal of a higher grade than that thus far discovered.



BIMETALLIC MILL. GRANITE COUNTY.

BREWERIES.

For the year ending June 30, 1901, there were 20 breweries in active operation in the State, each having worked the full 52 weeks of the year. The total amount reported as invested in the business was \$1,571,000, but this figure may be reduced about \$300,000 on account of a few concerns which reported capitalization instead of the actual investment, leaving \$1,271,000 as nearer the actual amount invested. There were 256 persons employed and \$283,310 paid for labor, an average yearly earning of \$1102.77 for each person, including superintendence. There are represented to have been 1,772,202 bushels of Montana barley bought and raised, but this is undoubtedly a duplication, as some brewers purchase their barley from others who have raised or bought a surplus supply. There were also 2,629,199 bushels of Montana malt reported as bought, but the same condition prevails in malt as in barley, and, therefore, this feature being inaccurate and tending to mislead will be omitted from future reports as the defect appears to be incurable. There were 25,300 bushels of barley bought outside of the State, as also 349,698 bushels of malt. These figures are rather under than over the true amount. The amount of beer manufactured was greater than in any other year, the total number of barrels being 163,283, having a selling value of \$1,374,864. The labor cost was \$1.74 per barrel.

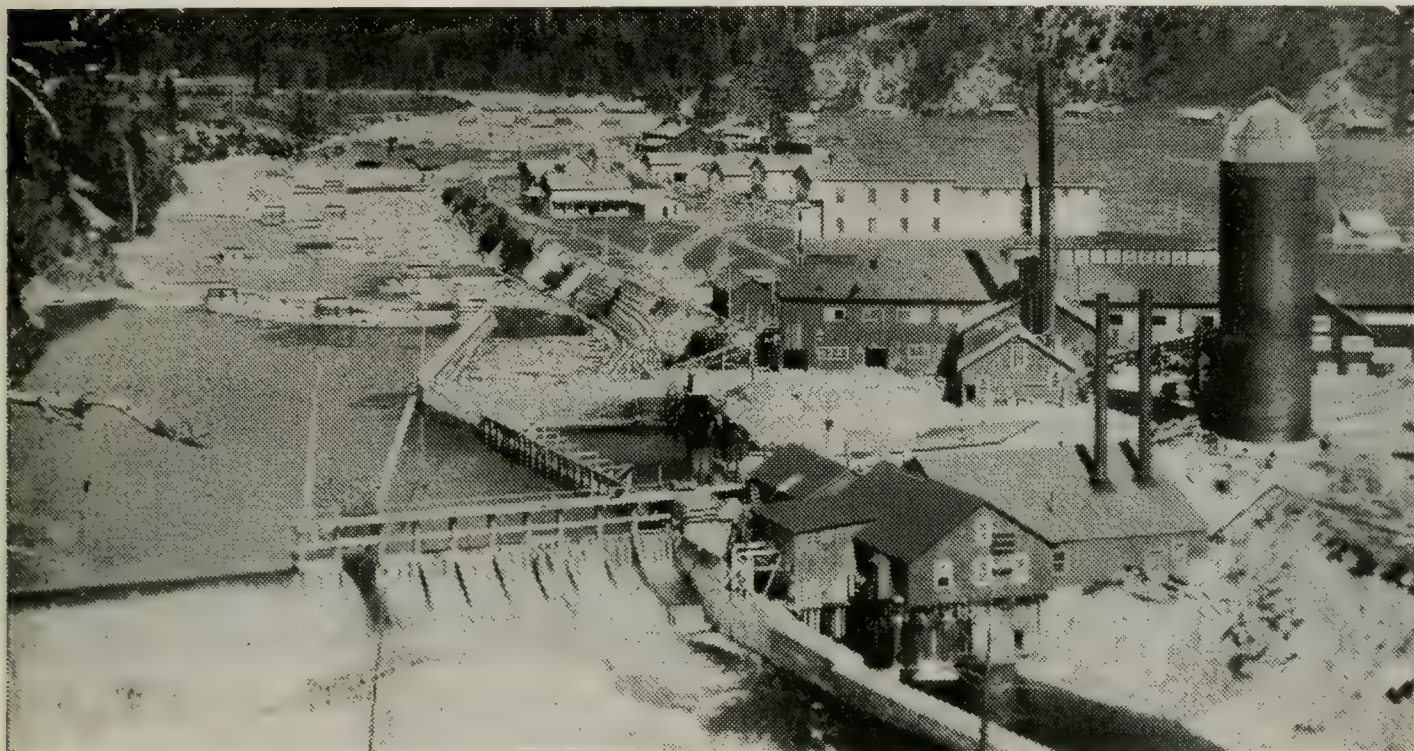
During the statistical year ending June 30, 1902, the new brewery of the Capital Brewery Company, Helena, was added to the list, making a total of 21 in the State. The total amount invested in the industry in the State for this year being reported at \$1,808,000, an increase of \$237,000. But, again, the amount actually invested and the capitalization have been confused in reporting this item, and for this year there should be a reduction of \$450,000, leaving a legitimate investment of approximately \$1,358,000. The amount paid to 251 employes was \$265,380, or \$1,057.29 each. There were 158,849 barrels of beer made with a selling value of about \$1,348,070. Average labor cost \$1.67 per barrel. In former years there have been discrepancies in this item, some breweries reporting the actual cost price of production and others the selling price, so that for the two years under consideration the reports in relation to this item have been disregarded and computations made as to the value of the product based upon the selling price per barrel in each town. This brings the value rather higher than the facts, perhaps, owing to the beer that is shipped away from the city where it is manufactured selling at approximately 50 cents per barrel less than is charged at home in order to meet competition, and the freight on empty kegs returned should also be charged against this. In future the actual selling price will be reported. Under this computation the average price per barrel for the State was for the former year \$8.49, and for 1902, \$8.42.

The progress of the brewery industry in the State is remarkable—greater than any other manufacturing industry—as may be better understood by a comparison with 1893, in which year 15 breweries reported a product of 42,671 barrels. At this ratio 21 breweries would have made only 59,739 barrels, 103,544 barrels less than was manufactured in 1901, the ratio of increase being 175.12 per cent in nine years. The product of 1901, expressed in gallons was 5,143,415, being 21.14 gallons for every inhabitant.

SAW MILLS.

ANALYSIS OF TABLES FOR THE YEAR ENDING JUNE 30, 1901.

The Bureau's mailing list of saw mills contains 135 names to all of which blank forms were sent from one to three times. Sixty-five replies were received, 11 of which were either too incomplete to be utilized in the table, or reported no production during the year. Fifty-four, or 40 per cent of the total number, reported a product as shown in the tabulation. From the reports received it appears that the industry experienced a most satisfactory condition of trade as is evidenced by the fact of the percentage of increased



BIG BLACKFOOT SAW MILL, BONNER.

business claimed by the Bureau's correspondents. Five concerns show a varying increase under 10 per cent each; three have increases of 10 and 12 per cent; four have increased 25 per cent each; one 50 and one 60 per cent, while 26 concerns reported the condition of business as "about the same" as compared with the year ended June 30, 1900, which was a year of therefore unrivaled activity. Two report decreases of 6 and 10 per cent each; two 50 per cent and one 80 per cent, each of these being small mills and the loss of business was due to local unimportant causes.

Ten million and forty-two thousand feet of lumber and 500,000 lath were shipped out of Montana.

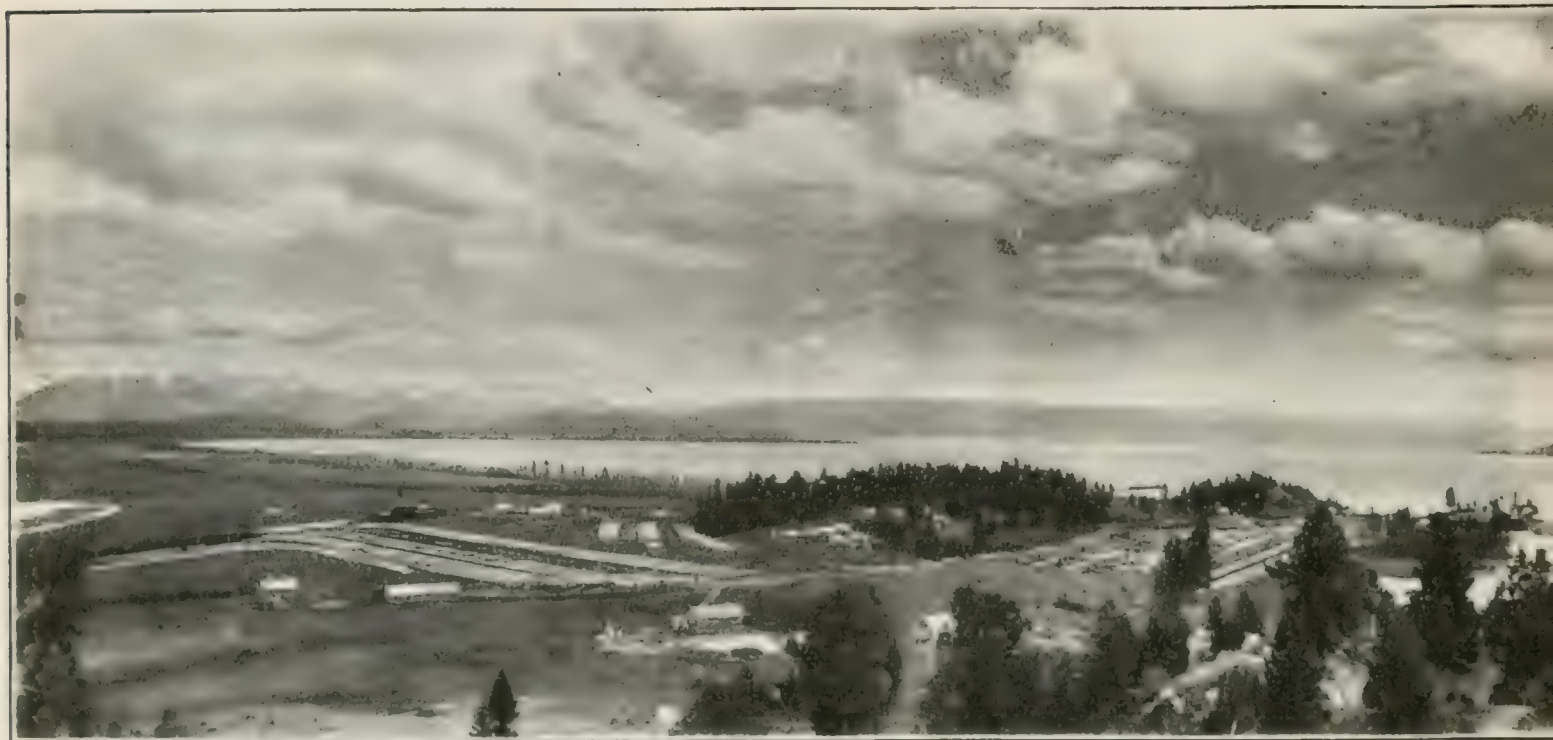
Ten hours constitute a day's work at all of the mills with one exception, which is a very small producer working 11 hours a day.

These figures cannot be taken as reflecting the volume of the lumbering industry in the State in consequence of the 51 per cent of mills that have

failed to report. A general knowledge of the industry, however, suggests that the total product for the year might reasonably be estimated at 40 per cent more than the table accounts for and very possibly 50 per cent would come nearer the facts, which would give a total product of 140,000,000 to 150,000,000 feet of rough lumber, and some of the non-reporting concerns are extensive establishments that produce a large amount of shingles and lath, and dressed lumber that would amount up to some thousands of dollars as a dressed product, exclusive of its value in the rough.

ANALYSIS OF TABLES FOR THE YEAR ENDING JUNE 30, 1902.

Reports were received from 86 saw mills, being 63.70 per cent of the addresses which appear on the Bureau's mailing list. This is the largest



VIEW OF SOMERS, FLATHEAD COUNTY.

(The John O'Brien Saw Mill Yards at the right and the Tie Preserving Plant at the left.)

percentage of returns ever made and is due to the fact that a great many were secured by a personal representative from the office and, as appears in the table, the figures of the product are almost double those of any year since the creation of the Bureau, nine years ago. There has been a large increase in the lumber cut during the past nine years, but the increase shown in this report is to be attributed more to the partial personal canvass than to any other cause. The increase represents more than all else the difference in the two methods of collecting statistics—correspondence and that by personal investigation.

Of the 86 saw mills reporting six did not run during the year; two were burned; one moved from the State; five went out of business and three circular letters were "returned to writer," leaving 69 or 51.11 per cent which reported a product of some character in this line.

An idea of the classification and rate of production of the various mills is conveyed from the following table:

Mills which produced in rough lumber

25,000 and less than 50,000 feet	2
75,000 and less than 100,000 feet	4
100,000 and less than 150,000 feet	5
150,000 and less than 200,000 feet	4
200,000 and less than 250,000 feet	6
250,000 and less than 300,000 feet	3
300,000 and less than 350,000 feet	4
350,000 and less than 400,000 feet	1
400,000 and less than 450,000 feet	1
500,000 and less than 550,000 feet	3
550,000 and less than 600,000 feet	1
600,000 and less than 650,000 feet	2
800,000 and less than 850,000 feet	1
1,000,000 and less than 1,500,000 feet	7
1,500,000 and less than 2,000,000 feet	4
2,000,000 and less than 2,500,000 feet	1
2,500,000 and less than 3,000,000 feet	2
3,000,000 and less than 3,500,000 feet	2
4,000,000 and less than 4,500,000 feet	2
5,000,000 and less than 5,500,000 feet	1
6,000,000 and less than 6,500,000 feet	2
7,000,000	3
8,000,000 (about)	2
14,000,000 (about)	1
21,500,000 (about)	1
35,000,000 (about)	1
46,000,000 (about)	1

Total, excluding two planing mills 67

The number of feet of rough lumber produced was 210,047,000. The gross value of all products was \$1,908,724. The total number of persons employed at 61 mills was 2,011, there being 3,500,000 feet of lumber sawed by eight mills which made no report of the number of men employed; six of these were employed at a planing mill which did no sawing; therefore, 2,005 employees produced 103.02 thousand feet of rough lumber per capita besides all the shingles, lath and all the dressed lumber except 550,000 feet of planing work and \$3,500 worth of sash, doors and blinds. The amount paid for labor, which often is reported from the total amount of pay-rolls, including superintendents, foremen and office force, was \$1,109,328 which represents 58.12 per cent of the value of the gross output. The average earnings per man on this basis was \$545.96, excepting that the amount paid to labor at the mills not reporting the number of employees is deducted in order to preserve the integrity of the calculation. The value of the gross product per man (after making a similar deduction) was \$930.01.

The hours worked per day are 9 and 10, most of the large mills now working 9.

The amount invested to every thousand feet of rough lumber sawed (and this sometimes includes capitalization rather than actual investment) was \$30.14. The product value is 33.18 per cent of the investment or capitalization as the case may be.

Each of the 60 mills reporting as to the number of weeks run shows an average operation of 20.20 weeks. Only 18 mills ran 30 weeks or more, and only one ran 52 weeks.

Missoula county produced 41.44 per cent of the total feet of rough lumber; Flathead county 37.44 per cent and Ravalli 16.19 per cent, the balance being divided between the other counties where saw milling is only carried on in response to local demands.

From the data at hand, and a careful consideration of that which is lacking, together with a review of the industry in a general way, the Bureau

is persuaded to place the estimate as to the gross amount of timber sawed during the statistical year ended June 30, 1902, at the round figure of 230,000,000 feet, and this is conservatively close.

Following out the estimate of the United States Geological Survey as to the amount of timber on the Lewis and Clarke reserve, which is given as 2,664,360,000 feet, board measure, there is on all the reserves of the State a total of 14,974,800,000 feet of merchantable lumber. To the timber on the government reserves is added the estimated amount of 912,000,000 feet on the state lands which brings the grand total to 15,886,800,000 feet. At the rate of consumption for the statistical year under consideration this supply would last about 70 years, but, as a matter of fact, the ratio of consumption is bound to increase which will cause the supply to run short of that time. In addition to the government and state timber land, however, is the timber upon the lands of the Northern Pacific Railway Company and the various saw mill and mining companies who own their own lands. which makes up a considerable amount that is beyond the reach of any statistical estimate.

When it is understood that a great many of the saw mill operators do not keep any books at all it can the better be realized how impossible it is to obtain exact statistics on this subject. And, again, their remoteness from transportation at reasonable expense is an insurmountable obstacle to the gathering of complete data though by experience and experiment it may be said that this report more nearly approaches perfection than might be reasonably expected. Great care has been exercised in the statements of the analysis of the table in order to prevent misleading impressions and there is a great amount of confidence felt in the accuracy of the conclusions.

REPORT OF SAW MILLS FOR THE YEAR ENDED JUNE 30, 1901.

Tracing No.	No. of Employees.	No. of Weeks Operated.	Amount Invested in the Industry.	Amount Paid for Labor.	No. Feet of Lumber Cut.	Value of Same at Mill.	No. Shingles Produced.	Value of Same at Mill	No. of Lath Produced.	No. Feet of Dressed Lumber.	Value of Same, Excluding Value of Rough Lumber.	Value of Sash, Doors and Other Manufactures.
1	2	20	\$800 00	\$50 00	150,000	2,250 00						
2	2	25	300 00	100 00	100,000	1,200 00						
3	3	6	700 00		100,000	1,000 00						
4	3	5	1,500 00	162 00	100,000	1,000 00						
5	8	5	300 00	630 00	80,000	1,040 00						
6	10	24	3,000 00	2,200 00	400,000	4,800 00						
7	3	26	2,000 00	700 00	100,000	1,350 00						
8	6	20	3,500 00	1,964 00	350,000	4,200 00						
9	4	6	3,000 00	200 00	100,000	1,500 00						
10	5	10	6,000 00	2,000 00	400,000	6,000 00	75,000	675 00	150,000	60,000	180 00	
11		16	800 00		400,000	2,400 00						
12	3	16	7,000 00	1,000 00	40,000	600 00	5,000	80 00	20,000	20,000	60 00	
13	6	32	5,000 00	2,000 00	600,000	6,300 00						
14	5	26	2,400 00	1,600 00	563,000	3,378 00						
15	3	15	1,000 00	471 00	333,000	5,328 00						
16	7	4	1,500 00	250 00	50,000	750 00						
17					5,000,000	40,000 00				2,500,000	2,500 00	
18	5	5	1,000 00	195 00	150,000	600 00						
19	44	24	30,000 00	20,281 87	6,000,000	36,000 00			800,000	1,600 00	4,750 00	
20			12,000 00	2,500 00								
21	15	32	5,000 00	4,000 00	1,200,000	9,000 00				626,000	1,252 00	
22	24	3	10,000 00	1,020 00	500,000	3,500 00			100,000	200 00	4,000 00	
23	15	11	3,500 00	2,000 00	240,000	1,685 00						
24	6	12	3,000 00	1,000 00			800,000				6,500 00	
25	9	20	2,000 00	500 00	100,000	900 00			50,000	150 00	300 00	
26	6	6	3,000 00	350 00	35,000	245 00					90 00	
27	6	30	8,000 00	3,000 00	600,000	6,000 00					800 00	
28	2	30	1,250 00	600 00							2,000 00	
29	2	7	280 00	127 00	118,000	1,200 00						
30	4	40	2,000 00	1,600 00	500,000	3,000 00						
31	10	30	1,500 00	3,000 00	700,000	6,300 00						
32	10	43	2,500 00	4,000 00	400,000	6,000 00						
33	2	28	1,200 00	150 00	100,000	1,500 00						
34	4	9	10,000 00	500 00	100,000	1,200 00						
35	9	48	2,400 00	3,000 00	400,000	4,800 00					400 00	
36	8	6	2,500 00	800 00	150,000	1,800 00						
37	15	12	3,000 00	1,134 00	2,000,000	10,000 00			60,000	180 00	160 00	
38	30	26	6,000 00	13,385 42	2,500,000	17,500 00						
39	67	31	6,600 00	23,366 25	5,200,000	26,000 00						

REPORT OF SAW MILLS FOR THE YEAR ENDED JUNE 30, 1901—Continued.

Tracing No.....	No. of Employees..	No. of Weeks Op- erated.....	Amount Invested in the Industry..	Amount Paid for Labor.....	No. Feet of Lum- ber Out.....	Value of Same at Mill.....	No. Shingles Pro- duced.....	Value of Same at Mill.....	No. of Lath Pro- duced.....	Value of Same at Mill.....	Value of All Oth- er Products.....	No. of Feet of Dressed Lumber.	Value of Same, Ex- cluding Value of Rough Lumber ..	Value of Sash, Doors and Other Manufactures.....
40	26	28	3,000 00	25,000 00	5,000,000	25,000 00								
41	1	1	400 00	200 00	20,000	200 00								
42	8	30	1,000 00	1,200 00	400,000	3,200 00								
43	6	4	1,800 00	234 00	170,000	1,700 00	15,000	37 50				6,000	60 00	
44	288	52	119,897 59	180,348 84	26,379,611	211,036 88			5,189,000	10,378 00	30,000 00	20,000,000	16,000 00	7,658 45
45	10	19	1,600 00	1,100 00	600,000	4,200 00								
46	15	5	2,000 00	750 00	250,000	2,000 00								
47	1	5	500 00	50 00	50,000	500 00		15 00						
48	35	12	6,000 00	11,000 00	2,600,000	21,000 00						1,000,000	1,000 00	
49	1	4	7,000 00	50 00	200,000	2,000 00								
50	14	26	15,000 00	4,160 00	1,100,000	8,800 00			70,000	1,575 00				
51	1,395	52		20,000 00	4,000,000	32,000 00								
52		32	1,604,000 00		28,000,000	224,000 00	1,500,000	2,400 00	4,800,000	7,200 00	1,440 00	21,000,000	21,000 00	120,000 00
53	8	45	3,000 00	9,800 00	1,000,000	10,000 00								
54		7	13,000 00	1,725 00	275,000	2,200 00								
	2,168	1,026	1,933,727 59	355,454 38	39,303,611	768,162 88	2,400,000	4,202 50	11,809,000	22,038 00	31,440 00	52,192,000	62,832 00	127,658 45

REPORT OF THE PRODUCTION OF SAW MILLS BY COUNTIES FOR THE YEAR ENDED JUNE 30, 1902.

COUNTY	No. of Employees..	No. of Weeks Op- erated	Amount Invested.	Amount Paid to Labor.....	No. of Feet of Lumber Cut.....	Value of Same at Mill	No. of Shingles Produced	Value of Same at Mill.....	No. of Lath Pro- duced.....	Value of Same at Mill	Value of All Oth- er Products.....	No. of Feet of Dressed Lumber Produced	Value of Same, Ex- cluding Value of Rough Lumber..	Value of Sash, Doors and Other Manufactures....
Cascade	3	6	1,500	135	75,000	675	.....	.....	.....	.....	.....	.....	.....	.....
Choteau	4	25	1,000	400	200,000	2,600	.....	.....	.....	.....	.....	.....	.....	.....
Custer	10	48	7,700	2,850	496,000	4,978	.....	.....	.....	.....	.....	.....	.....	.....
Fergus	32	86	39,900	14,700	4,500,000	64,650	.....	.....	.....	.....	.....	650,000	1,300	.....
Flathead	674	412	594,650	285,546	75,642,000	616,720	700,000	1,500	7,650,000	20,450	2,500	52,905,000	89,633	3,500
Gallatin	7	44	6,400	3,275	750,000	8,700	.....	.....	.....	.....	.....	200,000	400	.....
Granite	21	46	28,000	5,300	2,000,000	14,000	.....	.....	.....	.....	.....	.....	.....	.....
Lewis and Clarke	8	59	4,900	3,686	580,000	8,600	.....	.....	.....	.....	.....	110,000	1,240	.....
Madison	12	45	6,000	5,000	825,000	9,950	300,000	750	.....	.....	.....	40,000	80	.....
Missoula	740	278	4,180,800	580,877	87,041,000	668,343	4,000,000	6,800	4,802,126	9,977	770	30,922,000	32,911	40,000
Meagher	3	25	2,000	1,200	300,000	3,600	.....	.....	.....	.....	.....	.....	.....	.....
Park	6	20	2,500	1,500	350,000	2,250	.....	.....	.....	.....	.....	.....	.....	.....
Ravalli	478	98	1,452,971	202,759	34,008,000	246,170	30,700	81	4,103,000	1,529	.....	26,663,000	12,334	19,203
Sweet Grass	13	20	3,800	2,100	380,000	4,660	500,000	750	.....	.....	.....	.....	.....	.....
Total	2,011	1,212	6,332,121	1,109,328	210,047,000	1,655,896	5,530,700	9,881	17,055,126	33,831	3,495	111,490,000	137,913	62,703

PRODUCTION OF BRICK AND OTHER

COUNTY	Common Building Brick Produced	Value	Front Building Brick Produced	Value	Alumina Fire Brick Produced	Value	Silica Fire Brick Produced	Value
Carbon	1,000,000	\$7,000 00						
Cascade	3,500,000	21,000 00	25,000	\$500 00	120,000	\$3,600 00	50,000	\$1,750 00
Custer	280,000	2,400 00						
Deer Lodge	10,498,000	52,490 00			1,700,000	57,800 00	740,000	25,160 00
Fergus	300,000	3,000 00						
Flathead	516,000	3,500 00						
Gallatin	100,000	850 00						
Lewis & Clarke	3,720,000	24,180 00	20,000	480 00			46,000	1,700 00
Missoula	1,000,000	6,500 00						
Powell	1,030,000	7,750 00	120,000	2,100 00				
Silver Bow	12,700,000	68,750 00	20,000	240 00	20,000	500 00		
Sweet Grass	100,000	1,000 00						
Yellowstone	450,000	3,150 00						
Total	35,194,000	\$201,570 00	185,000	\$3,320 00	1,840,000	\$61,900 00	836,000	28,610 00

Note—Total value of all clay products, \$319,065.

PRODUCTION OF BRICK AND OTHER

COUNTIES	Tracing No.	Common Bldg. Brick Produced	Value	Front Bldg. Brick Produced	Value	Alumina Fire Brick Produced	Value	Silica Fire Brick Produced	Value
Beaverhead	1	500,000	\$4,000 00						
Carbon	2	420,000	3,900 00						
Cascade	3	4,007,500	30,750 00	35,000	\$525 00	60,000	\$800 00		
Custer	4	400,000	3,200 00						
Dawson	5	250,000	2,250 00						
Deer Lodge	6	8,981,000	67,357 00			2,422,000	106,568 00	220,000	\$9,680 00
Fergus	7	300,000	3,000 00						
Flathead	8	2,550,000	16,900 00						
Gallatin	9	900,000	5,400 00						
Lewis & Clarke	10	4,000,000	26,000 00	12,000	300 00			15,000	650 00
Missoula	11	1,250,000	8,125 00						
Park	12	700,000	6,300 00						
Powell	13	750,000	4,500 00	50,000	7,500 00				
Ravalli	14	700,000	4,200 00						
Rosebud	15	170,000	1,530 00						
Silver Bow	16	15,200,000	84,500 00	25,000	400 00	100,000	3,000 00		
Yellowstone	17	1,975,000	15,325 00	10,000	300 00				
Total		43,053,500	\$287,237 00	582,000	\$9,025 00	2,582,000	\$110,368 00	235,000	10,330 00

Note:—Total value of all clay products, \$451,500.

CLAY PRODUCTS FOR THE YEAR 1900.

Paving Brick Produced	Value	No. of Feet of Sewer Pipe and Drain Tile	Value	Tons of Fire Clay Pro- duced	Value	Other Clay Manufactures	Value	Am't Invested in Brick and Clay Busi- ness.	Am't Expend- ed for Labor During the Year
.....	3,850	4,750 00	200,000	\$1,500 00	\$3,300 00	\$4,200 00
.....	41,000 00	10,900 00
.....	2,970	7,425 00	.....	.....	2,000 00	1,200 00
.....	50,000 00	84,637 63
.....	2,000 00	1,200 00
.....	3,000 00	2,300 00
.....	2,000 00	500 00
.....	18,000	\$3,300 00	.....	.....	.....	1,225 00	30,000 00	17,400 00
.....	150,000	130 00	7,000 00	4,100 00
53,000	\$795 00	.....	.....	.....	.....	52,000	1,040 00	150,000 00	6,977 72
.....	10,000	2,500 00	.....	.....	.....	.....	83,000 00	49,000 00
.....	300 00	500 00
.....	2,000 00	2,400 00
53,000	\$795 00	28,000	\$5,800 00	6,820	12,175 00	402,000	\$4,895 00	\$375,600 00	\$185,315 35

CLAY PRODUCTS FOR THE YEAR 1901.

Paving Brick Produced	Value	Feet of Sewer Pipe and Drain Tile Produced	Value	Tons of Fire Clay Pro- duced	Value	Other Clay Manufactures	Value	Am't Invest- ed in Brick and Clay Business	Am't Expend- ed for Labor During the Year ..	Tracing No...
.....	\$500 00	\$2,000 00	
.....	500 00	2,100 00	1
.....	****2,963	\$5,779 00	.....	.....	33,500 00	10,600 00	2
.....	2,000 00	2,600 00	3
.....	2,000 00	1,000 00	4
.....	1,267	11,403 00	(c) 3,703	18,518 00	50,000 00	88,270 00	5
.....	1,000 00	1,350 00	6
.....	7,000 00	8,437 00	7
.....	1,000 00	1,600 00	8
.....	30,000 00	18,758 00	9
.....	8,000 00	2,500 00	10
.....	5,000 00	3,500 00	11
110,000	1,100 00	.....	.....	75	300 00	.....	*1,500 00	103,380 00	9,150 00	12
.....	500 00	2,300 00	13
.....	10,000	2,000 00	.....	.....	.....	.....	1,600 00	470 00	14
.....	01,000 00	85,000 00	49,000 00	15
.....	12,000 00	10,734 00	16
110,000	\$1,100 00	10,000	\$2,000 00	4,310	17,482 00	3,703	21,018 00	\$342,980 00	\$214,369 00	17

* Hollow building blocks. ° Assay goods. (c) Crushed silica. **** Includes both rough and ground fire clay.

PRODUCTION OF STONE

COUNTY	GRANITE		LIMESTONE		SANDSTONE		SILICA	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Cu. Ft.		Tons		Cu. Ft.		Tons	
Beaverhead...							f 3,222	\$1,676 71
Carbon			r 200	\$100 00				
Cascade			f 70,000	38,500 00	m 5,000	\$2,500 00		
Deer Lodge	b 1,135,481	\$15,225 00	f 108,833	33,714 86	b 133,502	10,501 50		
Jefferson	b 15,000	10,000 00	f 44,000	23,000 00			f 32,988	13,254 00
	r 10,000	5,000 00						
Lewis and Clarke	b 69,400	7,980 00	f 39,600	29,875 00				
	a 2,200	3,100 00			b 500	400 00		
Meagher								
Missoula					b 8,250	750 00		
Powell								
Silver Bow	b 302,840	19,644 00	f 9,840	5,204 00				
	m 3,000	4,500 00						
Yellowstone					b 121,189	20,481 50		
					f 178,980	4,385 00		
					f 1,200	1,200 00		
Total.....	1,627,933	\$65,449 00	273,373	\$130,393 86	448,621	\$40,218 00	36,210	\$14,930 71

r—roads; f—fluxing; m—monumental; a—mixed building, monumental, curbing and coping; c—lime rock for building; fl—flagging; d—limestone rubble.

PRODUCTION OF STONE

COUNTY	GRANITE—DIMENSION		GRANITE—RUBBLE		LIMESTONE	
	Quantity	Value	Quantity	Value	Quantity	Value
	Cu. Ft.		Perch			
Beaverhead.....						
Carbon.....						
Cascade.....	b 7,000	\$14,000			lf 101,500 t	\$55,900
Dawson.....						
Deer Lodge.....					lf 16,800	50,000
Fergus.....	b 28,955	5,791	b 18,300	\$8,650		
Flathead.....					b 7,450 ft	3,200
Gallatin.....						
	m 3,800	2,700				1,000
Jefferson.....	b 17,000	10,000			lf 37,500	18,750
	m 100	50			b 6,000 ft	4,500
Lewis and Clarke.....	b 68,922	7,750	bd 13,201	7,900	lf 45,000 t	9,000
Madison.....						
Meagher.....						
Park.....			b 500	750		
	m 150	300				
Powell.....	b 250	250				
Rosebud.....						
Silver Bow.....	b 450,351	20,155	b 371,250	28,125	lf 4,500	2,250
Sweet Grass.....						
Yellowstone						
	b 581,178	\$03,946	b 300,050	\$37,531	lf 205,300 t	135,000
	m 4,050	3,050	bd 13,291	7,900	b 13,450 ft	7,700
Totals.....						1,000

sf—silica fluxing for smelters; lf—lime rock fluxing for smelters; t—tons; b—building; c—concrete; m—monumental; bd—buildings and dam; g—flagging; n—grindstones; pp—plaster parts; d—stucco.

FOR THE YEAR 1900.

MARBLE		LIME MADE		PLASTER PARIS		RUBBLE FOR GEN- ERAL USE		MISCELLANEOUS	
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Cu. Ft.		Tons				Cu. Ft.			
		400	\$3,800 00		\$500 00			125	\$ 950 00
		835	5,688 00						
		5,646	26,884 18						
		1,200	7,500 00						
						d 33,000	\$ 1,750 00	c 66,000	3,500 00
		24	300 00						
100	1,000 00	2,000	9,000 00						
100	\$1,000 00	10,105	\$53,172 18		\$500 00	33,000	\$1,750 00	66,125	\$4,480 00

Capital invested, \$173,100.00. Paid for labor, \$162,526.00.
There were 12,631 tons of lime rock mined and used for lime that is not shown under the head of "Limestone."
Value, estimated at 50c ton, \$6,315.00.

FOR THE YEAR 1901.

MARBLE		SANDSTONE—DIMENSION		SANDSTONE—RUBBLE		LIME MADE		MISCELLANEOUS	
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Cu. Ft.		Cu. Ft.		Perch		Bushels		Tons	
		b 1,000	\$500	b 3,000	\$750			sf 4,001	\$2,000
								pp 120	4,800
		b 13,680	9,576			19 625	6,857	d 960	\$,160
m 350	\$700	b 86 695	18,288	b 10,141	4,784	17,085	4,526	d 2,800	23,000
		b 1,194	300						
						95,000	10,000		
		b 200	80	b 2,000	1,300	10,000	4,000		
								c 2,000	
						32,400	8,100	sf 10,157	9,027
		b 2,500	2,600						
						4,000	1,400		
				b 300	375	1,000	550		
		b 85,800	800	b 23,200	2,420	10,000	2,500		
m 100	300								
				b 2,000	1,000	50,000	9 000		
						42,500	10,625	c 3,000	1,700
		b 5,610	183			2,000	900		
		g 4,000	8,000						
		b 21,000	36,500	b 8,149	4,110			n 150	3,000
m 450	\$1,000	b 217,649	\$68,827	b 48,790	\$14,739	283,610	\$67,458	sf 14,158	\$11,027
		g 4,000	8,000					pp 120	4,800
								d 3,760	31,160
								c 7 000	1,700
								n 150	3,000

NOTE — Total value of all stone products, \$467,488.00.

FLOUR.

From the earliest times of recorded history there is little doubt that cereals have formed an important part of the food of man, even at a time when no cereals were subject to cultivation, and only existed as wild plants. Then the grains were undoubtedly eaten in a raw state, subject only to sufficient bruising to remove the outer covering. This primitive custom was developed through successive stages of learning to cook the grain, grinding between rude stones, the mortar and pestle and dressed stones, until today the process is one based upon a high degree of knowledge of chemistry and physiology; of special machinery for cleaning and grinding the wheat, using elec-



PLANT OF THE JUDITH BASIN MILLING CO.

tricity as the motive power, and producing flour that is the envy of the world.

In the reduction of cereal grains to a fine powder by any process of pounding, abrasion or pressure, the various constituents of which the grain is composed behave differently toward the impact forces. The outer hulls of grain tend to break up into scales or fragments of more or less superficial area and of the thickness of the coatings themselves. The starchy remainder of the grain and a large part of the nitrogenous matter, on the other hand, are broken into small fragments. In the case of the starchy kernels there is a tendency to disintegration, and the protein matter breaks up into particles of regular size and of small dimensions. The germ of the cereal grains always

contains a large excess of oil which has a tendency to spread out and agglutinate into particles of a regular size in which are incorporated additional particles of starchy and protein matter. The first steps in scientific milling, therefore, are directed toward a more or less complete separation of the three important constituents of the grain, namely, the hulls, the germ and the starch and protein. In the modern mills all other methods have given way to the roller process in which the grains are disintegrated and reduced by passing through steel rolls either smooth or corrugated.

Flour milling is one of the few great industries which refuses to become thoroughly centralized, although the vast wheat fields of Minnesota and neighboring states, and California, have led to combinations of millers to cheapen production and the erection of enormous mills in certain localities. Much of the wheat, however, is, and will continue to be, ground in small mills, which form an important local industry. Montana is no exception to this rule.

The first flour mill erected in what is now the State of Montana was at St. Mary's Mission, in the Bitter Root valley, near the town of Stevensville, the Jesuit Fathers, DeSmet and Ravalli, having the work in charge; and the first mill on the east side was built at Bozeman in 1865, known as the McAdoo mill. Both of these mills are entitled to be classed as pioneer industries, though it is perhaps needless to say that the figures here given do not include their products. They have long since passed into history. From these small beginnings has grown a thriving industry, with modern buildings and equipment, exercising great influence over the grain production of the State. In fact, the facilities for flour manufacture have far outstripped the supply of wheat.

There are 21 flouring mills in Montana, representing an investment of \$750,000. They employ a total of 98 persons, pay in wages and salaries nearly \$80,000 a year, and their yearly output is valued at more than \$1,000,000. The great bulk of the wheat ground is grown in the State, although some is shipped in from Dakota to keep the mills running. Only two of the mills are operated 52 weeks in the year. The plants are classed as to capacity as follows:

Less than 100 barrels a year	1
100 barrels to 499 barrels	1
500 barrels to 999 barrels	3
1,000 barrels to 4,999 barrels	4
5,000 barrels to 19,999 barrels	8
20,000 barrels to 99,999 barrels	4

As to character of work done they are divided as follows: Merchant only, 13; custom or exchange only, 3; both merchant and custom, 5.

During the past year it is estimated that 1,275,455 bushels of wheat were made into flour and feed, a slight falling off from the previous year owing to the destruction of a large plant by fire. The number of pounds of flour made from each bushel of wheat ranges from 39.2 to 44 with an average of 41.5 pounds, making the total of flour produced 52,931,382 pounds, which has a value ranging from \$1.40 to \$2.05 per hundred, besides feed amounting to 23,585,917 pounds worth an average of 77 cents per hundred. Montana flour

enjoys an enviable reputation among the citizens of the State, and with proper facilities for more extended irrigation this product must undoubtedly increase sufficiently to furnish flour for export, while stock feeding will make a market for all other mill products.

Among the recent additions to the splendid milling properties of the State is that of the Western Milling Company at Missoula, owned by Senator W. A. Clark. This mill has an elevator with a capacity of 125,000 bushels, and is operated by electricity. Its presence will undoubtedly largely increase the wheat acreage of Missoula county, and insure the farmers a ready cash market for all the grain they can grow.

Aside from the wheat flour, Montana's mills ground 5,503 bushels of corn, 5,485 bushels of rye, 27 bushels of buckwheat and 2,195 bushels of barley.

GRAIN ELEVATORS AND FLOUR MILLS.

The increase in the production of cereals in Montana has led to very material changes in the facilities for handling it, and the number and capacity of the grain elevators in the State have kept pace with all necessity, and today they are sufficient to meet every demand. By far the greater number of these are along the line of the Northern Pacific railway, as that line passes through the older agricultural regions of the State, where the greatest development of irrigation has been accomplished. Located on the main line or branches of this road are some of the finest mills and elevators in the Northwest.

At Billings the Babcock Hardware company has an elevator with a capacity of 25,000 bushels which is well equipped.

In Big Timber the Montana Trading company's mill has a warehouse with storage capacity of 2,000 bushels.

At Livingston the A. W. Miles warehouse will accommodate 20,000 bushels.

Bozeman, located in the famous Gallatin valley, has several capacious elevators and is without doubt the best equipped in this direction of any city in the State. The Benepe-Owenhouse Company elevator has a capacity of 150,000 bushels. The Farmers and Merchants Elevator Company's elevator will hold 60,000 bushels. The Nelson Story mill elevator, 100,000 bushels, and the Bozeman Milling Company mill elevator 100,000 bushels, or a total for Bozeman elevators of 410,000 bushels. The Farmers and Merchants elevator is owned and operated co-operatively by the farmers and merchants, as its name implies.

Other elevators in the Gallatin valley are at Belgrade, where the Nelson Story Company has an elevator with a capacity of 250,000 bushels, with headquarters in Bozeman, and a warehouse of 10,000 bushels capacity, owned by E. M. Ferris, leased to the Belgrade Elevator Company. At Manhattan the Manhattan Malting Company has a private warehouse devoted solely to the care of their own grain with a capacity of 250,000 bushels. Mr. R. B. Chris-holm also has facilities for handling 3,000 bushels at his warehouse in Manhattan.

At Bonner, near Missoula, the Big Blackfoot Milling Company has three warehouses, with a total capacity of 88,000 bushels.

At Stevensville, south of Missoula, and in the heart of the world-renowned Bitter Root valley, the Missoula Mercantile Company has the largest grain warehouse in the State, with a capacity of 500,000 bushels, the company having its headquarters at Missoula. There are also the warehouses of the Amos Buck Company capable of handling 100,000 bushels, and the Henry Buck Company, able to care for 200,000 bushels.

At Victor, on the Bitter Root branch, the Missoula Mercantile Company has a warehouse of 10,000 bushels capacity.

Hamilton, the metropolis of the Bitter Root valley, has an elevator owned by the Anaconda Copper Milling Company with a capacity of 75,000 bushels, and a mill warehouse owned by the Hamilton Flour Mill Company with 30,000 bushels capacity.

Frenchtown, on the Coeur d'Alene branch, has a 4,000-bushel warehouse, owned by the Marion Brothers.

Plains, in the extreme western part of the State, has a 5,000-bushel warehouse, owned by Col. J. A. McGowan.

At Missoula the mill elevator owned by Senator W. A. Clark has a capacity of 125,000 bushels, making a total for all elevators and warehouses on the Northern Pacific lines of 2,107,000 bushels.

Institutions of this character are not so numerous along the line of the Great Northern railroad, but it is confidently expected that the completion of the work of the National Irrigation Commission in the Milk River valley will cause them to be rapidly extended. There are no elevators on this line east of Great Falls, but at that place the Royal Milling Company has a mill elevator with a capacity of 90,000 bushels.

At Kalispell the Kalispell Industrial Company has three elevators with 145,000 bushels capacity. The total grain and warehouse capacity for the State is, therefore, 2,340,000 bushels.

MANUFACTURERS IN MONTANA.

In accordance with the provisions of section 7 of the Census Act, the collection of the statistics of Anaconda, Butte, Great Falls, and Helena, were withdrawn from the enumerators and assigned to special agents.

The Twelfth Census confines the publication of detailed statistics of cities by industries to those which have a population of 20,000 or over. Butte is the only city falling within this requirement. Wherever the phrase "urban manufactures" is used in this bulletin, it applies only to those cities which were withdrawn from the enumerators and committed to special agents, and only to manufacturing establishments within the corporate limits of such places.

These statistics are presented in tables showing the comparative figures of the several censuses; the industries divided between the hand trades and the manufactures proper, also the statistics of governmental establishments, institutions, and establishments with a product of less than \$500, which three latter classes were not reported at previous censuses; the totals for the industries in cities withdrawn from enumerators and assigned to special agents, placing them in comparison with the totals for the state and the state exclusive of these cities; the totals for the state by counties and the totals for the state by specified industries.

Montana represents frontier conditions similar to those existing in the states reported in Census Bulletin No. 73. The manufacturing and mechanical industries are chiefly such as are incidental to mining and the development of agricultural resources. It is not a manufacturing State in the true significance of the term, and practically all the industries shown are those which are intimately connected with the building up of new sections of country, such as lumber and timber products, smelting and refining of metals, flour and grist mills, and the hand trades, and yet Montana is, to some extent, an exception to this rule, inasmuch as certain industries have developed, such as the manufacture of coke, and slaughtering, wholesale, which have not appeared in previous bulletins on the so-called territorial states. Nevertheless, the increase in the value of products, when measured by the percentage method, is abnormal, and the use of this method in stating the progress of new countries can be justified only on the ground of uniformity of treatment. The increase is made more striking because the statistics of smelting and refining are now for the first time included as manufactures.

In drafting the schedules of inquiry for the census of 1900 care was taken to preserve the basis of comparison with prior censuses. Comparison may be made safely with respect to all the items of inquiry except those relating to capital, salaried officials, clerks, etc., and their salaries, the average number of employees, and the total amount of wages. Live capital, that is, cash on hand, bills receivable, unsettled ledger accounts, raw materials, stock in process of manufacture, finished products on hand, and other sundries, was

first called for at the census of 1890. No definite attempt was made, prior to the census of 1890, to secure a return of live capital invested.

Changes were made in the inquiries relating to employees and wages in order to eliminate defects found to exist on the form of inquiry adopted in 1890. At the census of 1890 the average number of persons employed during the entire year was called for, and also the average number employed at stated weekly rates of pay, and the average number was computed for the actual time the establishments were reported as being in operation. At the census of 1900 the greatest and least numbers of employees were reported, and also the average number employed during each month of the year. The average number of wage-earners (men, women, and children) employed during the entire year was ascertained by using 12, the number of calendar months, as a divisor into the total of the average numbers reported for each month. This difference in the method of ascertaining the average number of wage-earners during the entire year may have resulted in a variation in the number, and should be considered in making comparisons.

At the census of 1890 the number and salaries of proprietors and firm members actively engaged in the business or in supervision were reported, combined with clerks and other officials. In cases where proprietors and firm members were reported without salaries, the amount that would ordinarily be paid for similar services was estimated. At the census of 1900 only the number of proprietors and firm members actively engaged in the industry or in supervision was ascertained, and no salaries were reported for this class. It is therefore impossible to compare the number and salaries of salaried officials of any character for the two censuses.

Furthermore, the schedules for 1890 included in the wage-earning class, overseers, foremen, and superintendents (not general superintendents or managers), while the census of 1900 separates from the wage-earning class such salaried employees as general superintendents, clerks and salesmen. It is possible and probable that this change in the form of the question has resulted in eliminating from the wage-earners, as reported by the present census, many high-salaried employees included in that group for the census of 1890.

The report shows a capital of \$40,945,846 invested in manufactures and mechanical industries in the 1,000 establishments reporting. This sum represents the value of land, buildings, machinery, tools, and implements, and the live capital utilized, but does not include the capital stock of any of the manufacturing corporations. The value of the products is returned at \$57,075,824, to produce which involved an outlay of \$837,971 for salaries of officials, clerks, etc., \$7,969,886 for wages, \$1,668,487 for miscellaneous expenses, including rent, taxes, etc., and \$32,702,650 for materials used, mill supplies, freight, and fuel. It is not to be assumed, however, that the difference between the aggregate of these sums and the value of the products is, in any sense, indicative of the profits in the manufacture of the products during the census year. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of the mercantile losses incurred in the business, or of depreciation in plant. The value of the product given is

the value as obtained or fixed at the shop or factory. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

The value of product, \$57,075,824, is the gross value, and not the net or true value. The difference between these two should be carefully noted. The gross value is found by adding the values of products in the separate establishments. But the finished product of one establishment is often the raw material for another. In such cases the value of the former reappears in the latter and thus the original cost of certain materials may be included several times in the gross value. The net or true value is found by subtracting from the gross value the value of all materials purchased in a partly manufactured form. In this way the duplications in the gross value are eliminated.

At the census of 1890 the schedule was so framed that it was impossible to find the net or true value. In the present census the schedule asked for the value of the materials in two classes, those purchased in the crude state and those purchased in the partly manufactured form. From the answers to these questions the net or true value of products may be computed. Thus, the gross value of products for 1900 was \$57,075,824. The value of materials purchased in a partly manufactured form was \$6,924,211. The difference between them, \$50,151,613, is the net or true value of products, and represents the increase in the value of raw materials resulting from the various processes of manufacture.

Montana was organized as a territory with its present area on May 26, 1864. Prior to that date it formed a part of the territory of Idaho. The Ninth Census (1870) was the first, therefore, in which the statistics of Montana were published separately.

Table I shows the manufacturing and mechanical industries as returned at the censuses of 1870 to 1900, inclusive, with the percentages of increase for each decade. This table also presents the average number of wage-earners employed by manufacturing establishments in comparison with the total population of the state, and the value of the land and buildings owned and reported by manufacturers as capital, in comparison with the assessed value of all real estate and improvements.

TABLE 1.—COMPARATIVE SUMMARY, 1870 TO 1900, WITH PER CENT OF INCREASE FOR EACH DECADE.

	DATE OF CENSUS			PER CENT OF INCREASE		
	1900	1890	1880	1870	1890 to 1900	1880 to 1890
Number of establishments	1,080	289	193	201	273.7	47.5
Capital	\$40,945,846	\$4,293,794	\$899,390	\$1,794,300	853.6	377.4
Salaries	563	(2) 310	(3)	(3)	81.6	.....
Wage-earners, average number	\$837,971	(2) \$295,800	(3)	(3)	183.3	.....
.....	10,117	2,386	578	701	324.0	312.8
Total wages	\$7,969,886	\$1,652,413	\$318,759	\$370,843	382.3	418.4
Men, 16 years and over	9,718	2,300	574	697	322.5	300.7
Wages	\$7,829,261	\$1,605,993	(3)	(3)	388.1	.....
Women, 16 years and over	287	75	3	2	282.7	2,400.0
Wages	\$100,233	\$43,809	(3)	(3)	128.3	.....
Children, under 16 years	112	11	1	2	918.2	1,000.0
Wages	\$30,392	\$2,608	(3)	(3)	1,065.3	.....
Miscellaneous expenses	\$1,668,487	\$296,684	(4)	(4)	462.4	.....
Cost of materials used	\$32,702,650	\$2,375,093	\$1,006,442	\$1,316,331	1,276.9	136.0
Value of products, including custom work and repairing	\$57,075,824	\$5,507,573	\$1,835,86	\$2,494,511	936.3	200.0
Total population	(5) 231,559	132,179	39,150	20,595	75.2	237.5
Wage-earners engaged in manufactures	10,117	2,386	57	701	324.0	312.8
Per cent of manufacturing employees to total population	4.2	1.8	1.5	3.4	.....	.....
Assessed value of real estate	(6) \$90,039,356	\$54,943,531	\$5,077,112	\$2,728,128	63.9	982.2
Value of land and buildings invested in manufactures (7)	\$14,162,070	\$834,997	(8)	(8)	1,596.1	.....
Per cent invested in manufactures	15.7	1.5	.....	.....	.....	.....

1 Decrease.

2 Proprietors and firm members with their salaries, were included with salaried officials, clerks, etc., in 1890.

3 Not reported separately.

4 Not reported.

5 Exclusive of 11,770 Indians and other persons on Indian reservations, which classes were not included at previous censuses.

6 As given for the year 1900, in Dana's Supplement, "State and City," to the Commercial and Financial Chronicle, under date of April 13, 1901.

7 Does not include the value of rented property.

8 Figures not accessible.

Note.—In the manufactures of Montana wage-earners received 13.96 per cent of the total value of the products including custom work and repairing for the year 1901, as compared with 30 per cent in the year 1890.

The rapid increase, shown in Table 1, for the manufacturing and mechanical industries of the State during the last decade, is due largely to the fact that the totals for 1900 include the smelting and refining of metals. At the censuses of 1880 and 1890 the statistics for smelting and refining were included in the report on mines and mining and not in those on manufactures, while the totals for 1870 included 34 establishments engaged in milling quartz not included in subsequent censuses. Notwithstanding the increase during the past decade, the manufacturing industries are inconsiderable as com-

pared with mining, stock raising, and agriculture, which are the principal industries of the State.

Table 2 divides the industries of the State between the hand trades and the manufactures proper. This table also gives the statistics for governmental establishments and establishments with a product of less than \$500, neither of which were reported at previous censuses, and, therefore, are omitted from the other tables and their use confined to Table 2.

TABLE 2.—SUMMARY FOR ALL ESTABLISHMENTS.

CLASSES	Number of Estab- lishments.....	Capital	Proprietors and Firm Members.....	WAGE EARNERS		Miscellaneous Ex- penses.....	COST OF MATERIALS USED				Value of Products, Including Custom Work and Repair- ing.....
				Average Num- ber.	Total Wages..		Total	Purchased in Raw State...	Purchased in Partially Man- ufactured Form	Fuel, Freight, Etc.....	
Total	1,182	\$41,002,143	1,261	10,130	\$7,974,272	\$1,671,587	32,717,909	20,625,771	36,924,211	\$5,167,927	57,112,692
Hand trades	498	1,646,980	567	1,134	918,943	181,918	1,355,446	59,667	1,227,197	68,582	3,236,418
Government establishments	3	12,500	.....	4	3,240	.....	7,520	6,700	820	.....	13,775
Establishments with a product of less than \$500	99	43,797	109	9	1,146	3,100	7,739	633	7,081	25	23,113
All other establishments	582	39,298,836	585	8,983	7,050,943	1,486,519	31,347,204	20,558,771	5,679,113	5,099,329	53,839,406

1 Includes bicycle and tricycle repairing, 8; blacksmithing and wheelwrighting, 12; boots and shoes, custom work and re-
pairing, 44; carpentering, 36; clothing, men's, custom work and repairing, 62; clothing, women's, dressmaking, 21; dyeing and
cleaning, 6; furniture, cabinetmaking, repairing, and upholstering, 11; lock and gun smithing, 10; masonry, brick and stone,
8; millinery, custom work, 31; painting, house, sign, etc., 22; paper hanging, 2; plastering and stucco work, 4; plumbing, and
gas and steam fitting, 21; taxidermy, 4; watch, clock, and jewelry repairing, 36.

In addition to the 1,182 active establishments, shown in Table 2, with a capital of \$41,002,143, there were eight idle establishments with a capital of \$335,248.

Table 3 combines the totals for the industries in Anaconda, Butte, Great Falls, and Helena, and places them in comparison with the totals for the entire State and the State exclusive of those cities.

The presentation of statistics in detail for cities is confined to those having a population of 20,000, or over. For Butte, which is the only city of

TABLE 3.—URBAN MANUFACTURES.

	WAGE EARNERS		Proprietors and Firm Members .	Capital	Number of Estab-lishments	Value of Products, Including Custom Work and Re-pairing	Cost of Materials Used.....	Miscellaneous Ex-penses.....
	Average Number	Total Wages						
Total for State	10,117	\$7,969,886	1,152	\$40,945,846	1,080	\$1,668,487	\$2,702,650	57,075,824
Total for urban manufactures	5,066	4,410,775	503	25,457,778	472	871,940	18,739,399	34,797,534
Anaconda	2,497	2,211,856	55	17,267,847	59	323,659	12,424,442	21,735,729
Butte	1,379	1,355,286	227	5,683,033	212	265,989	3,906,492	8,958,782
Great Falls	624	469,513	74	1,409,694	74	185,628	1,642,609	2,558,538
Helena	566	374,120	147	1,097,204	127	96,664	705,776	1,544,485
Total for state, exclusive of urban manufactures	5,051	3,559,111	649	15,488,068	608	796,541	13,963,251	22,278,290
Per cent of urban manufactures to total for the state	50.1	55.3	43.7	62.2	43.7	52.3	57.3	61.0

this class in the State, statistics for specified industries are presented in detail in Table 6.

As shown by Table 5 the manufacturing industries of the State are very largely limited to so-called neighborhood industries, the products being consumed at or near the point of production. The exception to this is the smelting and refining of ores. Mineral resources abound in the State, and smelting and refining of copper and lead are the most important branches of manufactures, the development of which has been facilitated by the abundant

TABLE 4.—MANUFACTURES BY COUNTIES: 1900.

COUNTIES	No. of Establishments....	CAPITAL.					Proprietors and Firm Members	SALARIES OF OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE EARNERS AND TOTAL WAGES	
		Total	Land.....	Buildings.....	Machinery, Tools and Implements.	Cash and Sundries.....		Number	Salaries....	Average Number..	Total
1 The State	1,080	40,945,846	\$1,631,077	12,530,993	\$6,455,511	20,328,465	1,152	563	\$837,971	10,117	\$7,963,886
2 Beaverhead	24	91,245	2,355	11,630	16,050	61,210	23	13	27,580	41	26,532
3 Broadwater	8	30,187	1,412	6,450	8,675	13,650	9	.....	.....	7	3,580
4 Carbon	21	87,795	3,505	35,925	28,580	19,785	26	2	1,000	32	15,915
5 Cascade	90	4,854,594	120,344	1,894,833	1,030,767	1,778,650	89	69	91,243	1,763	1,338,887
6 Chouteau	18	73,495	7,150	10,290	13,155	42,900	15	5	5,450	21	12,650
7 Custer.....	24	96,152	8,860	7,460	34,210	45,622	25	3	2,860	64	36,321
8 Dawson	11	60,310	5,500	12,675	21,885	20,250	11	2	1,920	56	39,308
9 Deer Lodge	79	17,473,504	160,885	5,657,499	1,562,127	10,092,993	76	99	191,113	2,560	2,253,441
10 Fergus	32	103,859	9,950	29,297	32,246	32,366	32	6	4,500	45	24,051
11 Flathead	48	655,904	133,366	60,880	188,132	273,526	53	14	24,780	377	268,328
12 Gallatin	57	472,514	13,440	91,635	101,695	265,744	60	14	13,355	98	59,419
13 Granite	34	143,855	8,409	18,625	71,795	45,035	44	6	6,600	99	46,130
14 Jefferson	15	47,507	7,220	6,525	18,915	14,841	14	6	4,280	35	21,767
15 Lewis and Clarke	147	3,513,696	152,262	950,090	1,495,001	916,343	170	84	119,332	1,076	695,935
16 Madison	28	88,100	6,480	19,065	40,070	22,515	35	.....	.....	31	17,575
17 Meagher	10	52,065	2,175	14,500	19,150	16,240	11	2	2,600	8	4,310
18 Missoula	50	1,180,122	114,325	138,536	280,666	646,595	53	22	21,800	491	301,043
19 Park	35	430,868	45,063	100,095	153,930	131,750	38	23	24,357	248	151,635
20 Ravalli	35	833,907	193,641	113,748	77,510	469,008	36	10	10,992	270	153,343
21 Silver Bow	237	10,260,139	618,049	3,280,760	1,093,385	5,267,936	252	172	274,849	2,608	2,427,862
22 Sweet Grass	10	38,025	1,445	4,200	15,900	16,480	9	2	1,800	12	7,375
23 Teton	12	35,095	1,095	4,150	11,800	13,050	12	.....	.....	22	11,012
24 Valley	6	9,725	210	1,800	4,915	2,800	7	.....	.....	6	2,340
25 Yellowstone	49	293,162	13,915	60,325	104,952	113,970	52	9	7,560	147	111,697

1 Includes 1 establishment in Crow Indian reservation, included to prevent disclosing operations of individual establishments.

waterpower of the Missouri river at Great Falls, within easy reach of the copper district.

The detailed statistics of the census of 1900 are presented in the four tables which follow.

Table 4 shows the totals for the State by counties.
Table 5 shows the totals for the State by specified industries.
Table 6 shows the totals for the city of Butte by specified industries.
Table 7 shows the totals for all industries in the cities withdrawn from the enumerators, exclusive of Butte, shown in Table 6.

TABLE 4.—MANUFACTURES BY COUNTIES: 1900—Continued.

Tracing Number.....	AVERAGE NUMBER OF WAGE EARNERS AND TOTAL WAGES—CONTINUED						MISCELLANEOUS EXPENSES					COST OF MATERIALS USED			Value of Products, In- cluding Custom Work and Repairing.....
	Men, 16 Years and Over		Women, 16 Yrs. and Over		Children, Under 16 Years		Total.....	Rent of Works..	Taxes, Not In- cluding Internal Revenue...	Rent of Offices, Interest, Etc...	Contract Work..	Total	Principal Mate- rials, Including Mill Supplies and Freight....	Fuel and Rent of Power and Heat.....	
	Average Number..	Wages....	Average Number..	Wages....	Average Number..	Wages....									
1	9,718	\$7,839,261	287	\$100,223	112	\$30,392	\$1,668,487	\$189,751	\$221,945	\$1,178,635	\$78,156	32,702,650	30,711,062	\$1,991,588	57,075,824
2	38	25,782	3	750	.....	.....	10,890	2,565	2,639	5,686	.....	172,542	156,591	15,951	288,935
3	7	3,580	.....	.....	.....	.....	2,768	246	343	2,179	.....	4,624	4,169	455	13,105
4	31	15,675	1	240	.....	.....	9,616	473	542	8,187	414	51,103	48,746	2,357	97,234
5	1,693	1,316,281	13	5,978	57	16,628	328,808	42,677	25,144	240,785	20,202	5,940,711	5,631,109	309,602	9,784,558
6	20	12,150	1	500	.....	.....	2,988	557	425	1,706	300	24,140	22,896	1,244	73,268
7	61	35,765	1	300	2	256	8,404	3,251	1,356	3,797	.....	104,998	99,254	2,744	182,675
8	56	39,308	.....	.....	.....	.....	2,792	737	746	959	350	33,709	32,061	1,648	89,719
9	2,531	2,242,795	18	5,740	11	4,906	330,194	13,172	99,601	214,621	2,800	12,504,184	11,951,723	552,461	21,900,882
10	41	22,283	3	1,668	1	100	5,897	1,487	905	3,255	250	49,434	47,285	2,149	127,211
11	375	207,308	2	1,020	.....	.....	28,840	3,336	3,264	22,240	.....	533,342	529,588	4,254	983,294
12	90	56,769	8	2,650	.....	.....	30,858	4,640	6,366	19,852	.....	283,035	277,604	5,431	490,378
13	99	46,130	.....	.....	.....	.....	5,416	1,274	888	3,232	22	82,908	81,403	1,505	177,246
14	28	20,221	4	1,250	3	296	1,546	649	349	548	.....	21,371	19,808	1,563	77,461
15	967	663,065	101	31,120	8	1,750	140,455	28,648	13,481	97,236	1,090	4,565,839	4,250,905	314,934	5,775,418
16	30	17,500	.....	.....	1	75	4,513	1,413	1,203	1,897	.....	49,837	48,312	1,525	109,741
17	7	4,110	1	200	.....	.....	1,040	75	389	576	.....	10,477	9,557	920	25,810
18	479	297,804	12	3,239	.....	.....	58,779	4,584	4,223	49,972	.....	806,708	796,642	10,066	1,479,402
19	246	150,866	.....	.....	2	169	8,953	2,266	3,206	3,273	208	312,746	306,864	5,882	652,926
20	267	152,605	1	600	2	138	24,526	1,290	12,943	10,293	.....	350,173	347,240	2,933	607,256
21	2,470	2,377,866	115	44,306	23	5,690	634,914	70,883	40,469	471,042	52,520	6,521,707	5,775,926	745,781	13,562,757
22	12	7,375	.....	.....	.....	.....	4,706	420	433	3,853	.....	41,896	41,290	606	64,810
23	21	10,860	1	182	.....	.....	2,344	740	802	802	.....	18,046	17,411	635	48,390
24	6	2,340	.....	.....	.....	.....	420	85	82	253	.....	3,647	3,428	219	12,234
25	143	110,823	2	490	2	384	18,820	4,283	2,146	12,391	.....	217,973	211,250	6,723	446,114

TABLE 6. MANUFACTURES BY SPECIFIED INDUSTRIES: 1900.

Tracing Number.....	MANUFACTURING AND MECHANICAL INDUSTRIES	No. of Establishments....	CAPITAL					Proprietors and Firm Members	SALARIES OF OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE EARNERS AND TOTAL WAGES	
			Total	Land	Buildings	Machinery, Tools and Implements	Cash and Sundries		Number	Salaries	Average Number..	Wages ...
1	All industries	1,080	40,945,846	\$1,431,077	12,530,993	\$6,455,511	20,328,265	1,152	563	\$237,971	10,117	\$7,969,886
2	Bicycle and tricycle repairing	8	8,789	.....	300	4,189	4,300	11	.....	.....	8	5,148
3	Blacksmithing and wheelwrighting	172	215,047	32,891	46,945	44,390	90,821	199	1	250	116	90,900
4	Boots and shoes, custom work and repairing	44	17,557	562	1,600	5,455	9,940	48	.....	.....	19	14,630
5	Bottling	3	38,750	250	1,500	5,000	32,000	2	.....	.....	8	6,081
6	Bread and other bakery products	27	291,362	34,550	59,100	117,931	79,721	31	23	14,580	96	56,168
7	Brick and tile	23	107,145	7,335	20,350	23,980	55,480	27	9	3,540	124	69,338
8	Carpentering	36	122,678	17,000	15,575	12,540	77,563	46	2	555	209	294,212
9	Carriages and wagons	9	71,169	8,200	14,109	12,543	36,317	11	7	5,880	34	34,718
10	Cars and general shop construction and repairs by steam railroad companies	7	524,725	37,500	163,135	141,513	192,577	.....	49	50,382	621	397,552
11	Cheese, butter, and condensed milk, factory product	3	6,823	25	800	3,433	2,575	1	.....	.....	2	1,101
12	Clothing men's custom work and repairing	62	588,733	104,700	392,700	8,355	82,978	70	3	5,310	156	122,923
13	Clothing, women's, dressmaking	21	120,945	46,700	66,650	2,665	4,930	21	2	7,200	96	28,321
14	Confectionery	4	27,613	.....	.....	11,800	15,813	5	8	3,520	22	14,897
15	Copper, smelting and refining	7	26,824,298	309,346	9,195,326	2,349,499	14,969,927	.....	107	233,711	4,200	3,791,903
16	Dyeing and cleaning	6	44,585	7,000	33,000	2,445	2,110	7	.....	.....	14	7,500
17	Flouring and grist mill products	20	715,189	25,445	127,186	160,045	402,513	16	26	27,100	67	51,871
18	Foundry and machine shop products	10	905,714	44,464	216,339	221,108	423,603	7	25	41,844	550	509,799
19	Furniture, cabinetmaking, repairing, and upholstering	11	37,415	650	790	8,250	27,725	13	1	600	21	21,503
20	Lead, smelting and refining	3	2,898,158	63,334	939,953	1,191,663	663,203	.....	27	73,818	563	397,771
21	Lime and cement	14	64,743	14,630	15,900	17,750	16,403	5	6	4,750	45	30,560
22	Liquors, malt	21	1,203,516	106,030	482,440	328,861	286,185	22	34	68,280	193	169,063
23	Lock and gun smithing	10	16,635	.....	.....	11,900	4,735	13	.....	.....	6	4,510
24	Lumber and timber products	139	2,530,224	452,105	224,102	568,164	1,345,853	178	35	44,416	1,191	637,924

TABLE 5.—MANUFACTURES BY SPECIFIED INDUSTRIES: 1900—Continued

Tracing Number.	AVERAGE NUMBER OF WAGE EARNERS AND TOTAL WAGES—CONTINUED						MISCELLANEOUS EXPENSES						COST OF MATERIALS USED			Value of Products, In- cluding Custom Work and Repairing
	Men, 16 Years and Over		Women, 16 Yrs. and Over		Children, Under 16 Years		Total	Rent of Works..	Taxes, Not In- cluding Inter- nal Revenue..	Rent of Offices, Interest, Etc...	Contract Work..	Total.....	Principal Mate- rials, Including Mill Supplies and Freight....	Fuel and Rent of Power and Heat.....		
	Average Number..	Wages ...	Average Number	Wages....	Average Number.	Wages. .										
1	9,718	\$7,839,261	287	\$100,223	112	\$30,392	\$1,668,487	\$189,751	\$221,945	\$1,178,635	\$78,156	32,702,650	30,711,962	\$1,991,588	57,075,824	
2	7	4,948	.....	.....	1	200	2,569	1,842	101	526	.....	8,377	8,134	243	26,518
3	114	90,554	.....	.....	2	426	18,029	11,278	2,259	2,878	1,614	116,162	102,623	13,539	438,452
4	19	14,630	.....	.....	.....	.....	6,108	5,201	187	620	100	18,669	18,359	310	72,067
5	8	6,080	.....	.....	.....	.....	1,920	240	190	1,490	.....	28,477	27,807	670	40,590
6	66	49,496	29	6,432	1	240	23,798	5,238	2,128	16,432	.....	202,467	196,485	5,982	416,411
7	122	68,538	1	350	1	450	3,640	1,046	357	2,037	200	30,150	4,538	25,612	134,334	
8	299	204,212	.....	.....	.....	.....	37,573	2,341	1,460	2,422	31,350	297,612	297,094	518	619,220
9	34	34,718	.....	.....	.....	.....	6,204	2,930	395	2,379	500	35,598	33,380	2,218	111,780
10	621	397,552	.....	.....	.....	.....	5,138	.....	4,728	410	.....	301,338	282,129	19,209	754,410
11	2	1,101	.....	.....	.....	.....	199	147	30	22	.....	6,022	5,713	309	8,418
12	135	112,278	21	10,648	.....	.....	25,782	18,579	3,564	4,589	50	125,140	122,377	2,763	374,389
13	1	1,300	95	27,021	.....	.....	4,888	3,899	287	682	.....	42,954	41,957	997	103,925
14	10	10,137	10	4,100	2	660	4,991	3,745	370	876	.....	37,245	36,262	983	80,840
15	4,258	3,777,328	4	2,500	28	12,155	556,852	25,000	128,005	388,945	14,902	20,556,336	19,195,864	1,360,472	36,387,063	
16	3	2,350	11	5,210	.....	.....	1,705	1,350	63	292	.....	3,428	2,824	604	11,087
17	67	51,871	.....	.....	.....	.....	41,516	500	8,583	32,183	250	818,442	805,396	13,046	995,702
18	548	509,175	.....	.....	2	624	44,041	268	3,888	39,885	.....	429,184	376,123	53,061	1,198,309
19	20	21,230	1	313	.....	.....	3,595	2,170	452	973	.....	30,097	29,557	540	77,725
20	563	397,771	.....	.....	.....	.....	47,626	.....	8,596	39,030	.....	4,835,771	4,465,433	370,338	5,264,253
21	45	30,560	.....	.....	.....	.....	3,254	300	309	2,645	.....	22,805	6,213	16,592	92,255
22	181	165,030	.....	.....	12	4,036	433,577	600	12,961	420,016	.....	375,631	339,763	35,868	1,276,331
23	5	4,330	1	180	.....	.....	3,462	2,148	137	1,177	.....	11,848	11,238	610	30,126
24	1,190	637,684	1	240	.....	.....	58,038	1,214	19,669	37,155	.....	1,665,536	1,665,536	.....	2,919,942

TABLE 5.—MANUFACTURES BY SPECIFIED INDUSTRIES: 1900—Continued.

Tracing Number.....	MANUFACTURING AND MECHANICAL INDUSTRIES	No. of Establishmentf....	CAPITAL						Proprietors and Firm Members	SALARIES OF OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE EARNERS AND TOTAL WAGES	
			Total	Land.....	Buildings	Machinery, Tools and Imple-ments.....	Cash and Sund-ries.....	Number		Salaries.....	Average Number	Wages.....	
25	Lumber, planing mill products, including sash, doors and blinds	8	275,781	53,850	37,650	61,681	122,600	7	14	10,970	49	43,810	
26	Marble and stone work	3	8,075	1,300	2,600	2,675	1,500	3	.....	.....	8	4,500
27	Masonry, brick and stone	8	92,110	2,600	2,450	14,985	72,075	9	5	7,420	155	164,012	
28	Millinery, custom work	31	42,935	675	2,500	1,520	38,240	31	4	2,575	58	20,300	
29	Mineral and soda waters	14	115,368	2,930	19,500	39,600	53,338	13	2	3,100	29	22,201	
30	Monument sand tombstones	9	45,824	1,850	2,900	2,612	38,462	10	2	2,740	20	15,335	
31	Painting, house, sign, etc	22	72,855	16,380	2,230	3,870	50,375	30	1	1,500	73	55,332	
32	Paving and paving materials	3	47,800	400	400	1,000	46,000	5	2	2,700	60	57,855	
33	Photography	22	35,397	100	3,600	21,200	10,497	26	.....	.....	16	11,162
34	Plastering and stuccowork	4	7,358	2,400	950	703	3,305	4	.....	.....	22	22,140
35	Plumbing and gas and steam fitting	21	154,771	3,000	3,500	14,989	133,282	19	16	19,676	146	124,585	
36	Pottery, terra cotta, and fire-clay products	5	344,564	47,500	101,501	83,903	111,660	3	7	9,388	102	81,551	
37	Printing and publishing, book and job.....	11	55,195	600	300	38,548	15,747	12	3	4,100	30	23,384	
38	Printing and publishing, newspapers and periodicals	78	715,985	54,885	88,402	393,111	179,587	68	91	134,788	455	310,802	
39	Roofing and roofing materials.....	3	6,140	.....	300	1,140	4,700	2	1	900	12	9,100
40	Saddlery and harness	47	215,005	16,150	25,850	17,819	155,786	48	7	5,948	67	56,596	
41	Slaughtering, wholesale, not including meat packing	5	241,826	7,600	22,700	10,959	200,567	3	9	12,600	37	33,693	
42	Taxidermy	4	11,775	650	2,250	625	8,250	4	.....	.....	1	300
43	Tinsmithing, coppersmithing, and sheet-iron working	28	111,030	24,300	33,590	18,380	34,760	22	5	4,750	72	64,876	
44	Tobacco, cigars and cigarettes	30	68,591	6,450	16,950	2,325	42,869	33	.....	.....	72	47,650
45	Watch, clock, and jewelry repairing	36	87,382	20,900	10,650	24,725	31,107	38	4	2,536	29	27,931	
46	All other industries (1)	31	787,463	53,780	132,020	445,602	156,061	29	25	26,544	153	101,077	

1 Embraces awnings, tents, and sails; 1 carriage and wagon materials; 1 charcoal, 1 coffins, burial cases, and undertakers' goods; 1 coke, 2; engravings, steel, including plate printing, 1; food preparations, 2; fur goods, 2; gas, illuminating and heating, 2; glass, cutting, staining, and ornamenting, 1; gloves and mittens, 1; hat and caps, not including fur hats and wool hats, 1; hosiery and knit goods, 1; jewelry, 1; lapidary work, 1; malt, 1; mattresses and spring beds, 2; oil, not elsewhere specified, 1; paper hanging, 2; patent medicines and compounds, 2; pickles, preserves and sauces, 2; soap and candles, 2.

TABLE 5.—MANUFACTURES BY SPECIFIED INDUSTRIES: 1900—Continued.

Tracing Number.....	AVERAGE NUMBER OF WAGE EARNERS AND TOTAL WAGES—CONTINUED						MISCELLANEOUS EXPENSES						COST OF MATERIALS USED			Value of Products, In- cluding Custom Work and Repairing.....
	Men, 16 Years and Over		Women, 16 Yrs. and Over		Children, Under 16 Years		Total	Rent of Works..	Taxes, Not In- cluding Inter- nal Revenue...	Rent of Offices, Interest, Etc...	Contract Work.	Total	Principal Mate- rials, Including Mill Supplies and Freight....	Fuel and Rent of Power and Heat.....		
	Average Number	Wages....	Average Number	Wages....	Average Number	Wages....										
25	48	43,390	.....	.....	1	420	5,027	1,032	1,508	2,487	.....	129,010	125,883	3,127	198,169
26	8	4,500	.....	.....	.....	.....	111	.....	38	73	.....	895	640	255	13,800
27	155	164,042	.....	.....	.....	.....	25,451	502	97	4,752	20,100	275,947	272,910	3,037	497,287
28 .....	.....	.....	58	20,300	.....	.....	15,704	12,427	778	2,499	.....	82,608	82,224	384	161,613
29	27	21,554	.....	.....	2	647	9,994	3,870	1,770	4,354	.....	44,559	43,072	1,487	128,840
30	20	15,335	.....	.....	.....	.....	4,421	926	253	1,242	.....	32,999	32,519	480	73,651
31	72	54,972	1	360	.....	.....	7,977	4,461	621	2,195	.....	62,543	62,153	390	177,621
32	60	57,855	.....	.....	.....	.....	1,290	.....	.....	1,290	.....	68,475	67,970	505	150,803
33	12	9,448	4	1,714	.....	.....	10,194	7,609	453	1,832	300	18,991	18,351	640	71,839
34	22	22,140	.....	.....	.....	.....	82	14	68	.....	.....	8,594	8,574	20	37,360
35	146	124,585	.....	.....	.....	.....	15,649	8,209	1,684	5,756	.....	133,514	232,513	1,001	475,077
36	101	81,404	.....	.....	1	150	11,525	675	1,537	9,313	.....	61,456	32,013	29,443	120,006
37	25	21,616	5	1,768	.....	.....	6,415	2,130	423	3,862	.....	20,917	19,357	1,560	69,431
38	395	295,513	27	10,625	33	4,664	96,453	20,185	5,240	66,141	4,887	173,570	158,919	14,651	911,668	
39	12	9,100	.....	.....	.....	.....	832	260	12	560	.....	8,500	8,500	.....	24,000
40	65	55,816	2	780	.....	.....	19,542	10,969	2,171	6,402	.....	148,725	147,221	1,504	301,728
41	35	32,493	2	1,200	.....	.....	7,798	5,300	888	1,610	.....	821,070	818,620	2,450	934,640
42	1	300	.....	.....	.....	.....	802	480	97	225	.....	2,950	2,865	85	13,050
43	72	64,876	.....	.....	.....	.....	8,290	4,057	1,392	2,241	600	86,240	85,244	996	213,869
44	55	43,566	2	1,164	15	2,920	18,674	4,647	792	13,027	208	69,578	68,935	643	173,739	
45	27	27,194	1	480	1	260	12,127	6,943	599	1,665	2,920	29,394	28,568	826	106,401	
46	132	96,689	11	4,848	10	2,540	57,744	5,019	3,805	48,745	175	322,826	319,206	3,620	696,035	

TABLE 6. MANUFACTURES IN BUTTE, 1900.

Tracing No.	MANUFACTURING AND MECHANICAL INDUSTRIES	No. of Establishments	CAPITAL					Proprietors and Firm Members	SALARIES OF OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE EARNERS AND TOTAL WAGES	
			Total	Land	Buildings	Machinery, Tools and Implements	Cash and Sundries		Number	Salaries	Average Number	Wages
1	All industries	212	\$5,683,033	\$497,950	\$1,786,503	\$696,776	\$2,701,804	227	114	\$121,734	1,379	\$1,355,285
2	Blacksmithing and wheelwrighting	13	14,675	4,000	1,700	1,975	7,000	19			13	11,730
3	Boots and shoes, custom work and repairing	14	5,220		800	1,790	2,630	14			9	7,480
4	Bread and other bakery products	12	57,435	21,350	19,500	7,510	9,075	15	6	3,560	18	17,090
5	Carpentering	10	58,350	10,800	5,700	2,950	39,100	13	2	555	78	91,550
6	Carriages and wagons	4	25,700		500	4,200	21,000	8			18	23,592
7	Clothing, men's, custom work and repairing	25	545,800	103,000	391,000	4,155	47,645	28	2	4,530	56	72,197
8	Clothing, women's, dressmaking	12	25,345	6,700	16,650	1,015	980	11	1	5,200	42	11,916
9	Confectionery	3	22,613			7,800	14,813	4	5	2,440	19	13,415
10	Copper, smelting and refining	3	3,408,799	110,000	1,080,000	329,700	1,889,099		25	22,505	369	427,362
11	Dyeing and cleaning	3	44,300	7,000	33,000	2,300	2,000	3			13	7,125
12	Lock and gun smithing	6	4,625			2,250	2,375	6			4	2,860
13	Lumber, planing mill products, including sash, doors and blinds	3	132,031	31,350	14,000	28,181	58,500	3	6	2,550	28	29,206
14	Masonry, brick and stone	4	18,000	2,600	2,450	950	12,000	5			44	53,270
15	Millinery, custom work	8	16,440			610	15,800	8	1	1,200	28	9,534
16	Mineral and soda waters	3	39,640			12,500	27,140	3	1	2,500	9	8,720
17	Monuments and tombstones	3	17,225	1,500	1,400	1,325	13,000	3			10	7,020
18	Painting, house, sign, etc	8	43,650	16,200	2,000	1,490	23,940	11	1	1,500	39	31,800
19	Photography	5	8,975			3,700	5,275	5			6	4,428
20	Plumbing, and gas and steam fitting	6	67,950			2,750	65,200	4	8	9,336	87	81,032
21	Printing and publishing, book and job	3	2,625	600	300	3,700	1,025	4	1	1,500	2	1,096
22	Printing and publishing, newspapers and periodicals	8	143,231	14,650	3,300	96,400	28,881	6	25	30,160	106	110,440

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TABLE 6.—MANUFACTURES IN BUTTE: 1900—Continued.

Tracing No.	AVERAGE NUMBER OF WAGE EARNERS AND TOTAL WAGES—CONTINUED						MISCELLANEOUS EXPENSES						COST OF MATERIALS USED			Value of Products, In- cluding Custom Work and Repairing.....
	Men, 16 Years and Over		Women, 16 Yrs. and Over		Children, Under 16 Years		Total	Rent of Works..	Taxes, Not In- cluding Inter- nal Revenue...	Rent of Offices, Interest, Etc...	Contract Work..	Total	Principal Mate- rials, Including Mill Supplies and Freight ...	Fuel and Rent of Power and Heat.....		
	Average Number.	Wages....	Average Number.	Wages ...	Average Number.	Wages....										
1	1,241	\$1,305,290	115	\$44,306	23	\$5,690	\$265,989	\$70,328	\$22,416	\$120,725	\$52,520	\$3,966,492	\$3,599,430	\$367,062	\$8,958,732	
2	13	11,730	.....	.....	.....	.....	2,909	2,625	129	155	.....	11,223	9,809	1,414	47,525
3	9	7,480	.....	.....	.....	.....	3,006	2,491	70	345	100	6,913	6,794	119	28,230
4	18	17,090	.....	.....	.....	.....	4,319	2,074	876	1,369	.....	57,352	55,733	1,619	84,616
5	78	91,559	.....	.....	.....	.....	28,216	1,176	385	1,005	25,650	104,170	103,994	176	249,594
6	18	23,592	.....	.....	.....	.....	3,243	2,370	43	330	500	22,593	21,425	1,168	70,610
7	75	65,499	11	6,693	.....	.....	13,822	9,100	2,024	2,698	.....	76,528	75,060	1,468	221,481
8	1	1,300	41	10,616	.....	.....	2,367	2,032	123	192	.....	18,055	17,751	304	43,272
9	9	9,045	8	3,710	2	660	3,373	2,305	210	838	.....	28,795	27,862	933	64,840
10	369	427,362	.....	.....	.....	.....	21,540	.....	6,764	14,776	.....	2,423,254	2,093,735	329,519	5,687,089
11	3	2,340	10	4,785	.....	.....	1,039	720	59	260	.....	3,114	2,654	460	7,475
12	3	2,630	1	180	.....	.....	1,007	900	37	70	.....	3,457	3,227	230	11,026
13	27	28,786	.....	.....	1	420	1,590	900	210	480	.....	25,459	23,962	1,497	62,767
14	44	53,270	.....	.....	.....	.....	20,891	392	97	302	20,100	72,874	72,849	25	161,084
15	.....	.....	28	9,534	.....	.....	6,634	5,100	365	1,163	.....	42,769	42,649	120	75,178
16	9	8,720	.....	.....	.....	.....	6,754	2,920	670	3,163	.....	16,158	15,766	392	51,000
17	10	7,020	.....	.....	.....	.....	1,138	480	138	520	.....	18,575	18,110	465	32,500
18	39	31,800	.....	.....	.....	.....	3,557	2,358	322	877	.....	28,013	27,648	365	90,670
19	5	3,648	1	780	.....	.....	4,084	3,420	104	560	.....	5,282	5,057	225	22,122
20	87	81,032	.....	.....	.....	.....	7,524	3,768	1,099	2,650	.....	116,870	116,600	270	256,077
21	2	1,096	.....	.....	.....	.....	627	450	33	144	.....	1,651	1,543	108	6,800
22	95	106,708	3	2,212	8	1,520	21,947	5,595	1,257	12,020	3,075	43,878	40,734	3,144	237,322	

TABLE 6.—MANUFACTURES IN BUTTE: 1900—Continued.

Tracing No.	MANUFACTURING AND MECHANICAL INDUSTRIES	No. of Establishments	CAPITAL					Proprietors and Firm Members	SALARIED OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE EARNERS AND TOTAL WAGES	
			Total	Land	Buildings	Machinery, Tools and Implements	Cash and Sundries		Number	Salaries	Average Number	Wages
23	Saddlery and harness	6	25,933			2,697	23,236	9	2	2,328	12	11,601
24	Tinsmithing, coppersmithing, and sheet-iron working	7	42,850	6,000	15,400	4,550	16,900	3	2	2,550	21	24,424
25	Tobacco, cigars, and cigarettes	6	14,900			400	14,500	7			27	20,052
26	Watch, clock and jewelry repairing	7	41,595	18,000	7,000	7,900	11,695	11	2	1,100	8	10,324
27	All other industries (1)	31	848,976	144,200	191,803	163,978	348,995	24	24	28,220	283	266,013

(1) Embraces awnings, tents, and sails; 1; bicycle and tricycle repairing; 1; bottling; 2; cars and general shop construction and repairs by steam railroad companies; 1; coffins, burial cases, and undertakers' goods; 1; engraving, steel, including plate printing; 1; foundry and machine shop products; 2; fur goods; 1; furniture, cabinetmaking, repairing and upholstering; 2; gas, illuminating and heating; 1; glass, cutting, staining, and ornamenting; 1; lime and cement; 1; liquors, malt; 2; mattresses and spring beds; 2; paper hanging; 1; patent medicines and compounds; 1; paving and paving materials; 2; pickles, preserves, and sauces; 1; plastering and stuccowork; 2; pottery, terra cotta, and fire-clay products; 1; roofing and roofing materials; 2; slaughtering, wholesale, not including meat-packing; 2.

TABLE 7.—MANUFACTURES IN CITIES UNDER 20,000 IN POPULATION: 1900.

1	Total for cities	260	19,774,745	\$285,783	\$6,119,251	\$2,440,502	10,929,209	276	228	\$353,732	3,687	\$3,055,489
2	Anaconda	59	17,267,847	140,385	5,599,648	1,487,006	10,040,803	55	96	188,815	2,497	2,211,856
3	Great Falls	74	1,409,694	75,588	382,756	458,039	493,311	74	66	88,443	624	449,513
4	Helena	127	1,097,204	69,810	136,847	495,457	395,090	147	66	76,474	566	374,120

TABLE 6.—MANUFACTURES IN BUTTE: 1900—Continued.

Tracing No.....	AVERAGE NUMBER OF WAGE EARNERS AND TOTAL WAGES - CONTINUED				MISCELLANEOUS EXPENSES					COST OF MATERIALS USED			Value of Products, In- cluding Custom Work and Repairing.....
	Men, 16 Years and Over	Women, 16 Yrs. and Over	Children, Under 16 Years		Total	Rent of Works..	Taxes, Not In- cluding Inter- nal Revenue...	Rent of Offices, Interest, Etc...	Contract Work.	Total.....	Principal Mate- rials, Including Mill Supplies and Freight ...	Fuel and Rent of Power and Heat	
			Average Number .	Wages....									
23	10	10,971	2	630	4,626	2,934	366	1,326	.....	15,462	15,091	371	42,632
24	21	24,424	.....	.....	3,235	1,800	532	903	.....	41,191	40,970	221	80,870
25	19	18,522	.....	1,530	5,278	930	114	4,234	.....	22,402	22,207	195	57,790
26	8	10,324	.....	.....	639	3,160	154	405	2,520	13,290	12,875	415	39,780
27	269	259,292	10	5,161	86,624	10,308	6,235	69,903	175	747,164	725,325	21,839	1,226,432

TABLE 7.—MANUFACTURES IN CITIES UNDER 20,000 IN POPULATION: 1900—Continued.

1	3,506	\$3,001,117	127	\$39,738	54	\$14,634	\$605,951	\$58,267	\$116,516	\$421,978	\$9,190	14,772,907	14,095,231	\$677,676	25,838,752
2	2,468	2,201,210	18	5,740	11	4,906	323,659	12,852	98,804	209,203	2,800	12,424,442	11,888,747	535,695	21,735,729
3	580	458,057	9	3,478	35	7,978	185,628	17,107	10,674	152,547	5,300	1,642,689	1,522,821	119,868	2,558,533
4	498	341,850	100	30,520	8	1,750	96,664	28,308	7,038	60,228	1,090	705,776	683,663	22,113	1,544,485

NEW INDUSTRIES.

THE OIL FIELDS OF MONTANA.

The area of the oil fields of Montana is very large; in fact, unless surface indications are all deceptive, this State has a greater extent of probable oil territory than any in the Union. That no systematic development work has ever been undertaken in these fields is not strange when the conditions are considered. Montana is a new State; its population is small; its area immense. Its people, since the earliest days, have found wealth in mining gold, silver and copper, or in sheep-raising or cattle-raising. They had neither the inclination or the knowledge essential to successful oil mining. Nor was there, until of late years, any market for the oil had they mined it. For these and other reasons, the great oil fields of the State, though long known to exist, have suffered continuous neglect at the hands of capital; and even now, though some work has been done, in a haphazard way, there is nothing like the intelligent interest and effort in these fields that their importance and promise would justify.

THE FLATHEAD FIELD.

Generally speaking, the petroleum found in the United States, west of the Mississippi, have the asphaltum base and occur in Cretaceous formation—shales and sandstones; that is, this is true of the Montana fields, so far as known, with the single exception of a narrow strip of oil-bearing formation lying between the North Fork of the Flathead river and the base of the Rocky mountains. The petroleum of this field, so far as can be ascertained by the presence of numerous seepages of the crude oil, is of the paraffine base; and it is interesting to note that accompanying the course of the Canadian Rockies and projecting across the boundary line into Montana, is a strip of Devonian rocks—the rocks in which are found the paraffine base petroleum of Pennsylvania. A careful and intelligent consideration of the geological conditions in this field would have prevented some costly errors that have been made there.

Development work was begun in the Flathead field early in the summer of 1901, by the Butte Oil Company. This company built a wagon road from Belton, on the Great Northern Railway, to the foot of Lake Kintla, four miles south of the international boundary line; over this they hauled, in the fall of 1901, machinery which was put in place on the north shore of Kintla lake. With the advent of the Butte company came other locators, who filed placer claims on all the ground from the boundary to the railway, some 400 square miles being thus taken. It is only proper to say that much of this was utterly worthless as oil land, and was evidently taken for speculative purposes only.

The next boring plant was brought in by the Kintla Oil Company, a Kalispell corporation; and at the date of this writing a third rig is on its way, the property of Eastern operators. The mistakes, accidents and delays which always accompany the first development work in a new field, have not been wanting here, and in spite of much effort and expense, no real test has yet



PROSPECTING FOR OIL

been made. The deepest hole is but 1,300 feet, and that put down in a formation so extremely difficult that it has taken a year to attain this depth. Nevertheless, it is a reasonable certainty that the Flathead field is a good district; and that it will yet be the scene of a great and profitable industry. The physical characteristics are as follows:

The surface aspect is hilly. The whole region is covered with timber, with small meadows here and there. There are numerous lakes and streams. Oil could be piped by gravity from any part of the field, along the water-courses, to railway.

Geologically considered, the floor of the valley consists of shales and sandstones to a great depth. The surface formation is the Laramie in which the coal measures occur. Beneath these coal measures, as in the Colorado fields, at Florence and elsewhere, are the oil-bearing strata. The uplift bordering the field on the east consists of very old limestones, schists, quartzose and amygdaloids. It is unnecessary, perhaps, to say that no oil in quantity can exist in such structure, and that boring into these compact, close-grained, ancient rocks for oil would be a waste of money. The bulk of the petroleum in this field will be found in the Cretaceous sands and shales underlying the coal measures. Prospect drilling will be necessary to locate the strikes and dips of the anticlines. The strike of the main anticlines is probably parallel with the strike of the main range, but it is impossible to determine this positively without drilling by the accepted triangulation method. Any other method of prospect drilling in new territory is expensive, hazardous and more than apt to result in failure.

The Bureau is indebted to the secretary of the Montana Land and Oil Company, Helena, for a copy of the analysis of the seepage oil on this company's property, located near Kintla Lake, which follows:

Naptha	2	per cent
Gasoline	4	per cent
Benzine	7	per cent
Illuminating oils (kerosene)	33 $\frac{1}{3}$	per cent
Valve oil (light lubricating)	17	per cent
Petroleum Jelly (vaseline) .	5	per cent
Heavy lubricant	10	per cent
Base paraffine	16 $\frac{1}{3}$	per cent
Residue waste	5 $\frac{1}{3}$	per cent
		<hr/>
		100 per cent

THE TETON COUNTY FIELD.

Much of that portion of Teton county known as the Ceded Strip affords every surface indication of being a rich oil field. This field extends far into the Blackfoot reservation, and it is indeed a pity that so valuable and extensive territory should be set aside for the sole use of a handful of Indians and squaw-men, who couldn't use half of it if they would. But as things are, the Noble Red owns it, and the only part of this territory open to a white man is west of the line of the reservation. This makes the field a narrow, wedge-shaped one, with its greatest width at the international boundary line, and the point of the wedge not far south of the St. Mary's Lakes. Between this field and the Flathead field intervenes the immense uplift of the main range of the Rockies, and the remarks made as to the futurity of boring into the elder formation in the Flathead field are equally pertinent here. In the Flathead field successful boring will only be done to the west of the uplift; in the Teton field to the east of the same uplift. In plain English, the

man who bores into the mountain rock structure in either field will lose his time and money.

In the Teton field, the uplift of the main range is accompanied by a strong over thrust and the plan of this overthrust is defined with great clearness. In the breccia occasioned by the riding forward of the older formation on the younger, asphaltum and oil are found in small quantities; while the shales and sands exposed by the erosion of the numerous streams are frequently highly bitumenized, and readily distil petroleum with gentle heat. Fumaroles—gas escapes—are numerous; and in the northern part of the field, just across the boundary, are remarkable seepages. From one of these “springs,” the owner collects as much as 50 gallons of crude oil in a day’s work. The Teton field is full of exposures due to erosion, and this makes it peculiarly easy for the expert examiner to locate the oil-bearing anticlines and, as a sequence, the correct sites for wells. The shales of this region are the Montana and Colorado, with a fresh-water sea deposition, known as the Belly River formation lying between. The sands and shales belong to the Cretaceous period, while the limes, quartzites and schists of the overthrust are Algonkian.

The country is for the most part open and accessible by good wagon roads from Blackfoot or Browning, on the Great Northern Railway. It is also easily reached from Calgary, on the Alberta side. Fuel and water are abundant, and the indications are certainly sufficient to justify extensive development work, with every prospect of rich returns on the capital so invested.

THE CARBON COUNTY FIELD.

In Carbon county the petroleums follow the general rule of the western product, and are heavy asphaltum-base oils, occurring in the sands underlying the coal measures. These oils are evidently the product of vegetation laid down in the quiet and shallow waters which once covered this region.

The principal development work in Carbon county has been carried on by Thomas Cruse, of Helena, and his associates. About 25 miles from Red Lodge, on Butcher Creek, these gentlemen have sunk four wells, two of which have penetrated the first oil sand and showed oil in the well in good quantity. It is pretty certain that if experienced oil men had been in charge of this work, Carbon county would now have producing wells. Without going into extended criticism, it may be pointed out, for one thing, that not a single well has been put down to a depth sufficient to tap the lower, or second and third sands, as they are called; and it is only when such a depth has been reached by the drill that one could reasonably expect to bring in a good well. Underneath the coal measures in Carbon county there is oil. Where the limestones and sands are in exposed contact, as along the Absarokee hills, seepages of the crude and thick deposits of asphaltum, float brea, fumaroles and similar unmistakable evidences of the presence of oil in the formation are frequent. If the surface indications were not sufficient to convince one of the presence of petroleum, the fact that the oil rose to a height of over 100 feet in one well drilled would set this matter beyond the reach of doubt. From the information given the writer, it would seem that this particular well would

have been a fair producer if it had been properly handled at the right time.

There is unquestionably a very large section of Carbon county underlaid with oil. It is not likely that the wells there or elsewhere in Montana, will ever be phenomenal "gushers." We will have no repetition of the Beaumont boom in this State, and it is better that we will not have. The prospector should bear in mind that good, steady pumping wells, showing indications of long life and with ground around them to support them, are the best properties. Such wells are worth at present about \$1,200 per barrel of daily flow; that is to say, a well producing 10 barrels of Paraffine base crude oil per day is worth about \$12,000, and as four acres is ample ground to support a well for a good life, this makes proven oil land worth about \$3,000 per acre. If we consider that in Flathead, Teton and Carbon fields alone there are at least 200,000 acres of good oil lands, the magnitude of this potential industry may be better appreciated.

BEAVERHEAD COUNTY FIELD.

Oil bearing shale in Beaverhead county was first discovered by W. Tate Taylor, of Dillon, some 15 years ago, but it has only been within two years that any attempt has been made toward proving the value of these deposits or to discover the source from which they are supposed to have come. In December, 1901, the Montana Oil and Fuel Company undertook the development of a piece of ground in Smallhorn Canon, some 10 miles from Dillon, owned by C. M. Stolle, a miner, geologist and expert chemist. Against the protests of Mr. Stolle the company started drilling in a synclinal basin, where on two sides shale beds each 100 feet thick were dipping toward the point selected for starting at an angle of about 20 degrees and on another side a bed of sandstone dipped toward the drill-hole at an angle of some 40 degrees. In such a location it is hardly probable that oil would ever have been encountered, even though the drill had been continued to the depth of its capacity. The only favorable indication noted in the progress of the work was an oil exudation at about 200 feet of depth, which may be taken as a generally friendly circumstance in favor of the region as a probable oil producer when intelligently attacked. The drill which was installed was capable of going 2,000 feet deep, but on account of difficulties which arose in the practical operations, attributable by some to one cause and by others to another, the work was discontinued at 325 feet without definite results having been determined. The log of the drilling showed about 40 feet of alluvial soil, followed by gravel drift, sandstone, blue clay, sandstone, Trenton limestone and a hard sandstone. At this point work was stopped.

Prior to the operations of the Montana Oil and Fuel Company the owners of the Columbia oil claim ran a tunnel in the shale on the mountain side for a distance of 60 feet and on the opposite mountain another tunnel was run 100 feet. These layers of shale are from 20 to 50 feet deep. The prospectors thought they were developing a coal mine. Several hundred pounds of the shale were taken to Dillon and Butte and subjected to destructive distillation with the result that from two to four ounces of crude petroleum was retorted from a pound of the shale. Also it was found that from a pound of this shale

a gas flame four inches wide and two inches high could be sustained for one hour.

Everywhere in this section an abundance of Cretaceous fossils are found and this with the presence of oil sand is taken as a good oil indication. A phenomenon which is abundantly vouched for by those familiar with the ground is the detonations heard in the earth at times, which has locally been attributed to gas explosions and which it is claimed caused a landslide in the fall of 1901. In oil bearing countries are found what are called by oil men "domes." These are present in this section. In many places are ash heaps showing where the shale has been burned and 500 feet above in the crevices of the rocks can be seen traces of the gases which probably escaped during this process in nature's laboratory. Something over 10,000 acres of land has been located. It has not been possible for the Bureau's agent to personally visit these fields, but the bare data as above was personally obtained from those who have an intimate acquaintance with them, some of whom are interested and others who are not—chiefly those who are not. In view of the impossibility of making a detailed investigation of the field itself an authoritative statement is herewith reproduced from W. G. King, professor of the department of chemistry and metallurgy of the School of Mines in Butte in the form of a report to the Montana Oil and Fuel Company:

"I have made a careful examination of the shale formations south of Dillon, Montana, and find shale beds in that locality of enormous proportions, varying from a few feet to 60 feet in width and extending miles in length, being traced through the country by the outcroppings.

"Upon subjecting these shales, gathered from various localities, to destructive distillation, I find them to yield a very large percentage of heavy shale oil and illuminating gases. The complete examination of these shale oils and gases has not yet been finished, but up to the present time every indication points to their being of immense commercial value.

"An examination of these fields was also undertaken with a view to determining the probable existence of petroleum oil in association with these immense deposits of petroleum shales, and every indication pointed to the presence of such oil, both from the contour of the country and the presence of gases emanating from the shale beds in various localities, and the presence of various running springs and marshy districts.

"It is my opinion that thorough development will reveal the presence of petroleum oil."

Oil mining, like every other form of mining, is cursed with fakirs and sharpers whose only aim is to drill holes in the public purse; who procure a few acres of "wild-cat" land and at once start the printing presses to work turning out stock certificates. There has been so much of this rascality that many persons have come to believe that all oil mining is a fraud. As a matter of fact, however, oil mining is a great and legitimate business. The petroleum products of the United States for the present year exceed in value the product of either the copper, gold or silver mines, and are exceeded in value only by the iron and coal outputs. The demand for crude oil steadily increases and there will not again come a time when oil cannot be marketed at a good profit. Under these circumstances the Montana fields would seem to offer an excellent opportunity to capital.

THE GENESIS OF OIL.

Concerning the genesis of petroleum there are many theories, most of them very foolish. The most reasonable and generally accepted scientific theory is, that the bitumens are derived from vegetation, deposited ages ago in sedimentary strata, slowly changing to carbonaceous matter to be afterward distilled by the intense heat of metamorphism. When vegetable tissue is buried deep in the ground the elements arrange themselves into new products. The oxygen slowly unites with the carbon to form carbonic acid, leaving substances rich in carbon and hydrogen. It is in this way that coal, peat and lignite have been formed. Graphite and anthracite coal were produced by great heat, the volatile matter being vaporized and probably afterwards condensed in porous and fissured overlying strata as, bitumen, petroleum and the like. Petroleum is not found in the altered rocks. It is found in the unaltered rocks, the shales and sandstones, into which it has migrated. The accumulations of oil and gas in the domes and summits of the anticlines prove that the bitumens are migratory and their general course is upward. This accounts also for tar springs and gas escapes.

Petroleums vary widely in smell, color and gravity. In the same oil field, in the same strata, even, there are differences in the oil. These differences are due to several causes. To the different kinds of vegetation from which the petroleum was distilled, to different temperatures in the process of distillation; to different degrees of pressure; to the varying rapidity of distillation; to the presence of different substances during distillation, and other causes.

Character of the Oil Bearing Strata.

Oil must be looked for in the unaltered rocks, such as shales and sandstone. Anticlines exercise a great effect upon the accumulations of petroleum and gas. When strata are bent into curves the upward curve is an anticline, the downward curve a syncline. If a capital "S" be laid on its back the left-hand curve would roughly represent a syncline; the right-hand curve an anticline. In other words an anticline is an elongated dome; a syncline a trough. It is in the anticlines that one must expect to find oil and gas. A quaquaversal is a dome-like elevation along the axis line of the anticline.

When a formation contains permanent water, oil and gas will be found in the summit of these domes. The water, being heavier, is at the bottom, the oil next on top and the gas, being lightest, on top of the oil.

Where there have been great uplifts, the tops of the anticlines are often worn away, and the oil will be found to have drained into the dips. Anticlines are often faulted. If an oil-bearing bed ascending, say, eastward, be faulted by a north and south fault, the ascent of oil will be stopped. In that case there will be plenty of oil on the west side of the fault, and there the well should be bored. On the east side of the fault there will be only water.

The petroleum is held in the porous rocks by a cover or incasement, which usually consists of shale or some other fine grained rock, in which is water. When water has taken possession of shale and similar rock, it is almost impossible for oil to eject the water and form a passage. Vice versa, it is very difficult for water to eject oil from a shale of which it has taken

possession. The bitumens, also, by hardening on the surface of deposits, form an impervious covering to retain the oil.

Water plays a strong part in the formation of oil deposits. It is water that first, by removing calcareous and silicious material, fits the sandstone to be the porous receptacle of the oil, and it is the bouyancy of water which impels the oil upward into the receptacle.

Hot, silicious waters, upon cooling, also deposited silica in the shales forming the so-called "shells" which are capable of holding the oils and gases imprisoned. If water did not float oil upward, little oil would ever be seen. In the anticlines the pressure of water is from below, upward on the oil, and the pressure of the gas is downward. With all these forces confined under immense rock pressure, it is little wonder that the oil often leaps out in a column 100 feet and more, high, when the drill has given it a little door of escape upward.

Indications of Petroleum.

These consist of seepages, fumaroles, leached shales, red shales, black shales silicified, natural gas, traces of mineral springs, cracks in which bitumen occurs, etc.

Exposed bitumens are black and brown. They can be distinguished by their smell and taste. They melt in the flame of a match and they readily dissolve in chloroform, turpentine or bisulphide of carbon, forming a black or brown solution.

Gas escaping is not always a certain indication of petroleum, but carburetted hydrogen is a much surer indication than sulphuretted hydrogen or carbonic acid gas. The prospector should know how to distinguish between these. Carburetted hydrogen burns with a yellow flame; sulphuretted hydrogen with a bluish flame. Carbonic acid gas does not burn at all. Acetate of lead paper and blue litmus paper may be exposed to the gas to test it. If sulphuretted hydrogen, the acetate of lead paper will turn brown; if carbonic acid gas, the blue litmus paper will turn red. The prospector should learn how to make these simple tests.

In examining strata, the prospector should search in gulches, canyons and along banks of streams for here he will find the best exposures. The surface should be examined, and any brown or black substances found should be tested to see if they are bituminous.

More frequently than not, oil deposits are overlaid with leached shales and sandstones. These are, therefore, to an extent, good surface indications.

Mineral springs are always found in company with petroleum deposits. Therefore these springs, or indications of their existence, are indications, to a certain extent, of the presence of petroleum.

The dip of exposed strata and the depth to which a well must be bored, can easily be ascertained by the clinometer. The strike of an anticline may be followed to a long distance and justify boring even in territory that shows no surface indications of oil.

The perusal of these hints will not make an expert, or even a good prospector of anyone, but it will have a value to one who really desires to learn and who is not afflicted with the notion that he can master a difficult study

in 15 minutes reading. The oil expert and the oil prospector must supplement theory with much practice in the field.

GEOLOGY OF PETROLEUM.

The following, written by Mr. G. W. Miller, a mining engineer of Denver, for the *Western Mining World*, is regarded as worthy of reproduction for the benefit of those interested in prospecting for and developing oil claims:

Petroleum is derived from the latin word *petra*—a rock—and *o'leum*—oil or rock oil.

It is also known as *naptha*, which is the lightest variety of hydrocarbons when in the condition of oil. The heavier kind valuable for lubricating purposes is called "*maltha*." The constituents of petroleum exist also in the form of gas, chiefly as carburetted hydrogen. Heavy carburetted hydrogen is composed of one equivalent of each carbon and hydrogen. This gas condensed produces *naptha*—the lightest and most volatile of oils; yet by the evaporation of hydrogen and the absorption of a small quantity of oxygen when subjected to atmospheric influences, it emerges into *maltha*, and subsequently by giving up more of its hydrogen, it turns to bitumen, or asphaltum, *gilsonite*, *elaterite*, *ozokerite*, *hatchettite*, etc. Hence, the origin of these last named solid hydro-carbon minerals. Petroleum is essentially a compound of hydrogen and carbon. The lighter varieties in their native condition consist of nearly equal parts of carbon and hydrogen, but by weight from 85 to 90 per cent of carbon and from 10 to 15 per cent of hydrogen. The upper oil, or that nearest to the surface is always the heaviest and most valuable for lubricants; this is due to a loss in hydrogen which renders it thick and heavy in consequence. This character of petroleum is the so-called "*maltha*" of the western oil fields, and it finds a ready market at prices ranging from \$9 to \$12 per barrel.

In boring for oil it is important to bear in mind that the coal measures in the western country exist in the lower Tertiary and upper Cretaceous formations, and that the oil will be found not above but below the coal beds. Two distinct oil bearing horizons may be justly expected, viz: one in the upper, and the other in the lower sandstones. The distance down from the coal measures to the oil bearing sands will vary somewhat with the existing geological conditions of the region, but I may say a fair or mean average of depth may be said to be from 200 to 400 feet for the upper oil bearing sand, and from 1,000 to 1,500 for the lower. If not denuded, the coal measures will be found covered by the overlying Tertiary beds, glacial deposits, etc. The geological order of deposition of these formations overlying the coal measures may be identified as follows:

First: Soil, clay, pebbles and sand.

Second: Loosely stratified conglomerates and sand.

Third: Basalt, andesite and rhyolyte lavas.

Fourth: Conglomerate sandstones.

Fifth: Shales and clays made of volcanic detritus.

Sixth: Now a seam of shaly clay and then the coal measures.

The geological order of formations below the coal beds and until the lower oil bearing sand is reached, is

First, sandstone.

Second, drab shales and clays.

Third, limestone.

Fourth, dark shale.

Fifth, conglomerates and sandstone.

Sixth, variegated clays, red marl and sandstone.

Seventh, limestone.

Eighth, thick red conglomerates.

Ninth, thick sandstone lying on gypsiferous shales, and probably the oil bearing stratum.

The above is the correct natural geological order of strata from the recent to the lower Triassic formation as they occur in the Rocky mountain and Pacific coast states. Whether this series of strata will be found uniform or not, or existing at all in any given locality, will depend altogether upon subsequent methods of erosion and denudation in operation, the topography of the country, methods and conditions existing at the time of deposition, and indeed it should be no great surprise to meet with a vastly dissimilar arrangement.

From the most productive regions of petroleum in the East which exist with the broad plateau extending from the western anticlinal of the Alleghany coal fields to and beyond the Ohio river, and where every warp and woof of geological structure has been scientifically diagnosed, the following important geological observations are deduced:

First, the most abundant formations of oil rock exist at from 400 to 700 feet from the surface.

Second, more oil may be justly expected from the second than from the first formation of oil rock.

Third, the first oil sands exist at from 100 to 400 feet below the coal measures.

Fourth, the second oil sands are about 1,000 feet below the coal measures when the Carboniferous limestone does not exist, and 1,500 feet where it does exist.

Fifth, the lithological structure of the rocks must be uniform and nearly horizontal.

Sixth, there must be no steep dips or dykes or abundant gas fissures in the vicinity.

That the coal beds in the eastern regions exist in rocks of the Carboniferous age, while in the western country they are found in the lower Tertiary or upper Cretaceous series, should be remarked, and not lost sight of when selecting oil lands. As regards depth in boring, the western oil horizons are in a great measure similar, but with respect to age and system of rock formation, the eastern regions are countless ages the senior, and their strata vastly different in order of arrangement.

In the Pennsylvania oil field the geological formations are as follows:

First, the coal measure.

Second, a layer of mill stone grit.

Third, the upper oil sands.

Fourth, a thick stratum of carboniferous limestone which shades off to sandstone upon the western anticlinal.

Fifth, lower oil bearing sandstone.



A MONTANA HUNTER'S CAMP.

MONTANA'S FIRST WOOLEN MILL.

To Sweet Grass county the doff of the hat is due from all its sister counties of Montana's Commonwealth. Big Timber, the county seat, is destined to henceforth enjoy the distinction of being the original home of the woolen mill in Montana, and this is a distinction that, in the very nature of things in relation to the wool industry, will be the more notable as years go by. One may well wonder, and the question has very often been asked, "Why is it necessary that all the millions of pounds of wool that are yearly shorn from the flocks of Montana be shipped to the far East—wool, dirt, grease and all—there to be washed, scoured, dried, picked, carded, spun and made in cloth; and then, bargained for by some Western merchant, when it is put on the cars, returned to Montana and sold, perchance, to the very man from whose sheep the wool originally came?"—a round trip of some 4,938 miles, in the course of which tribute is paid out for every mile of travel and every transition stage that it passes through.

The more critically the wool industry of this State is examined and studied the more ridiculous does its practical operations seem to be. For instance, to reduce the subject to mathematical facts, there was produced in the State from the clip of 1901 not less than 32,000,000 pounds of wool. This is shipped to Boston at a freight charge of \$1.61 1-2 per cwt., aggregating \$516,800 for the season's clip. Granting that the average price paid the wool-growers for their product was, during the season of 1901, 14 cents per pound, the total product in the grease would yield \$4,480,000 to the wealth of the State. When, after the wool arrives in the East, it is scoured, there is a shrinkage of 63 per cent in its weight, leaving a clean product ready for the carding and spinning machines of 11,840,000 pounds, but which, at this stage, has increased in market value to 43 cents per pound, or \$5,091,200. Therefore, there is actually lost to the people of this State, by reason of the wool being scoured outside, the difference between \$4,480,000 paid them by the buyers, and the \$5,091,200 representing the enhanced value, notwithstanding the nearly two-thirds shrinkage in weight, or \$611,200. This amount, added to the freight on its eastbound trip, to say nothing of this item on that portion which returns to us in the finished state ready for consumption, reaches the astonishing dead loss of \$1,128,000.

Reflecting upon this condition of affairs one might be led to a further analysis of the situation, namely: Estimating all the sheep in Montana on this date (December 4, 1901,) at 4,000,000 and at an average value for 10 years of \$3 per head, including lambs, the aggregate value would be \$12,000,000. The one item of transportation on the railroad from Montana to Eastern markets will absorb the value of all the sheep in the State once every 23 years 2 months and 13 days. Or, the loss from the two items of freight eastward, and the difference in the value of the wool in the grease and the scour-

ed product, will annihilate the value of all the flocks on the ranges of the State in 10 years, 7 months and 9 days.

These calculations, simple as they are, would seem sufficient to make a Montana sheep wonder why he could not have been raised in cultured Boston under the guardianship of the astute railroad manager, the favored scourer of his fleece, and near by the legislative shepherds of his race.

During the early part of 1901 Mr. William Whitfield, the promoter and manager of the Big Timber woolen mill, came to Montana to look into the practicability of inaugurating a woolen factory and finally settled upon that flourishing young town as a favorable location for reasons that, combined, would seem to insure success of the enterprise. Probably the greatest of these reasons was the fact of the exceptional public spirit of the people of Sweet Grass county and their shrewd discernment when called upon to view and pass judgment upon a business undertaking. Though it is true that the business men of the town had encountered failure in two less important undertakings in prior years, this fact only emphasizes their indomitable spirit, and Yankee alertness to industrial opportunity. Their history during the past 10 years may be epitomized in the word progress. Another, that Sweet Grass county probably has as many sheep upon its ranges to the square mile of territory covered as any other county in the State with a possible exception or two that would not materially modify the facts for the purposes of the enterprise in hand. It was also found that the water carried from the mountains to the proposed site of the mill on the Boulder river was most admirably adapted to the scouring of wool, and a ditch taken from the river but a short distance above the site brings it in position for utilization for power, as well, though no wheel has been installed to the present time.

Messrs. Wm. Whitfield & Sons were in the wool manufacturing business at Lanark, Ill., for several years, Mr. Whitfield and his two sons having had lifelong experience in this branch of commercial industry. They had the machinery and the people of Sweet Grass county had the wool, and to bring these two essentials together under a mutually beneficial arrangement was the basis of negotiations. As a result a stock company, capitalized at \$50,000, was organized, Messrs. Whitfield & Sons putting in as their share the necessary machinery for the start, and subscriptions ranging from \$50 to a few thousand were soon gathered together, amounting in the aggregate to a sufficient sum to erect a stone building 40x84 feet, two and one-half stories high with a basement equally as commodious for their uses as either of the other floors. Five acres of ground were donated. The building was started about May 1, 1901, and by October 1, Mr. Whitfield, with the assistance of his two sons and one helper, had all the machinery that is now working, in place, and blankets were coming from the looms.

It was an unfortunate circumstance for the first year's business that so much time was necessarily consumed in construction and the setting up of the machinery, but in the case of the latter, it was absolutely impossible to procure the services of men experienced in this class of machinery, and the Montana machinists, superior as they are in the kind of work they are

called upon to do, would be little better than mere helpers, when assembling the thousands of pieces that require the most delicate adjustment in carders, spinners, looms, etc. It was unfortunate for last year's business for the reason that the representatives of both Eastern and Western factories and jobbing houses had already visited the trade as early, even, as January and February, and all along during the spring and summer, as well, taking orders for fall and winter delivery, thereby leaving only the "short orders" for later travelers to book. This was the condition which confronted the traveling salesman of the mill. Nevertheless there have been produced in the neighborhood of 1,200 pairs of blankets; orders have been filled for a considerable number of business houses about the State; not a complaint has been received relative to the quality of the goods; orders have been duplicated; letters of commendation and encouragement are occasionally received from the retailers; some have made offers for the entire product and promises of orders for this next season aggregate away beyond the capacity of the machinery so that the setting up of the balance of the original plant and the purchase of new machines is under consideration at the present time.

There is one particular reason why this mill will find response from the consumers of woollen goods in Montana that is perhaps above other considerations and this will be true as long as the wage earners, who compose by far the major portion of our population, are employed at present going wages. It is a fact, easy of confirmation, (if one will take the trouble to inquire of any traveling salesman who covers this State in conjunction with any of the prairie states, as to the character of goods sold in the two sections), that Montana people buy better and purer grades of merchandise than do any of the Middle, Western or Eastern states. The wage earners of this State, but more particularly the organized wage earners, have thus far been accustomed to feeding their stomachs less adulteration and clothing their bodies with less shoddy than any wage earners in the country outside of the Rocky mountains. The great question with a man who has lived in Montana a sufficient time to have become imbued with the genius of her great wealth-producing resources, the dignity and remuneration of labor, the profits of industrial activity, the good fellowship and tendency towards social equality, as compared with Eastern sections, is to get good goods. It is a recognized fact among merchants that the first and chief inquiry of this class of men and women, when making purchases is, "Is it good?" "Is it wholesome?" "Is there any shoddy in it?" The brief experience of this mill has demonstrated this fact to the manager who acknowledged that he "would have to make better goods in Montana" than he had in Illinois because the people demanded them and were willing to pay the price. In Illinois very few blankets, indeed, of a weight exceeding five pounds were sold, and by far the most of them were only four-pound goods. In Montana there will be extremely few sold that do not weigh more than five pounds. The machines are working on five to eight-pound goods now and some inquiries have been received for 10 and 12 pound blankets, and nothing but **all wool** is wanted. The people may be sure that when they buy a Big Timber blanket it is the simon pure article, for the reason that there is not a thread of cotton or scrap of shoddy about

the mill, and it is claimed that cotton cannot be profitably shipped in for use as filling, as the freight on shoddy more than offsets the difference between the price of cotton and wool. This fact will act as a guaranty in favor of the Montana product.

Again, it was ascertained from a conversation with one of the employes, who has had practical service in mills in various states, that as good a grade of woolen goods could be produced by the machinery of this mill as any mill in the country. He would not concede that the goods of any other factory were superior either in point of purity, style, workmanship or finish. To be sure, up to the present time, no particular effort has been made at fancy patterns because that feature involves experienced labor. For the present the product has been confined to blankets of the popular colors though as a matter of fact neither the machinery or the skill of the management is limited to the making of blankets alone, as was attested by a considerable number of samples of cloth of various patterns for suitings, etc., that were shown the Bureau's representative by Mr. Whitfield, who had made them on the same machines in the East.

In the basement of the mill is located the engine and boiler room containing a 60-horse power boiler and 40-horse power engine. Also, in this department is located two washing vats, two wool-dyeing vats, in which the wool is stirred about in the dye for from three-fourths of an hour to an hour and a half, scarlets requiring the least time to finish. A batch for dyeing consists of 100 to 150 pounds to the tank. From the dyeing tanks it is spread upon the screen floor of the drying room where it is dried by the heat of steam pipes underneath the screen. When dried it is carried to a machine having a cylinder with teeth like those of a threshing machine, but smaller, which is encased in iron. This is called the picker and it is used to further separate the dirt from the wool and at the same time pulls it more or less apart, making a rather fluffy product ready for the first breaker or carding machine. The picker is also the machine that mixes the differently dyeing wool for colored products. From the picker the wool goes to the third floor where it is put through the first breaker, being fed into rolls on one end, emerging at the back and to one side of this machine in the form of a lightly twisted, soft rope about an inch in diameter, wound upon a spool 12 inches wide and is about 8 inches in diameter when filled. From this machine it goes to the second breaker from which 20 loosely twisted cords, about a quarter of an inch in diameter, are made and automatically wound around a spool that is about 30 inches in length. In each of these processes a little dirt is taken from the wool. From the second carder 13 of the large 30-inch spools are adjusted upon the spinning machine which is approximately 35 to 40 feet long and from these large spools containing 20 quarter-inch cords, each of the cords are strung to bobbins which are set on the opposite half of the machine and this half advances and retreats a distance of about eight feet. Each time the portion having the bobbins backs away from the other half of the machine on which the large spools are placed, the large spools yield some of the heavy cord during the first half of this movement, and during the last half of the trip the heavy cord is reduced in size by pulling and twisting at the same time and is wound on the bobbins in about the size of ordinary white

cotton twine that everyone is familiar with. All this is done automatically with one boy merely to regulate the tensions of the spinner and mend any one of the 260 threads that may be broken at times as the bobbin carriage moves backward. Without any delays this machine will spin nearly half a million feet of yarn, or warp, per hour. There are two set up and another that can be assembled together at any time it may be needed.

From the bobbins the warp is placed on an immense cylinder and from there again transferred to a cylinder that, when filled, is about 14 inches in diameter and seven feet long. This last cylinder is part of the loom appliance and it is directly from this cylinder that the blankets are made with the assistance of a bobbin that is placed in a shuttle and makes a noisy racket as it is automatically thrown back and forth at right angles with and between the two sets of thread warp, one above the other, that unroll from the large cylinder. The shuttle-thread is called the filling. When a border is put in near the ends of a blanket, as is usual, it is done by the use of as many shuttles as there are colors demanded and the shuttle is changed for each color. Three of these looms are running at present, each requiring one person to operate it. The ordinary capacity of the looms is 20 to 22 blankets a day. Probably a maximum would be 24. From the looms the blankets go through a washer, are dried and then finished by putting the nap on them which is done by means of allowing teasles that are fixed on a large cylinder to roll gently against it which puts on a beautifully soft, fuzzy nap. Teasles are a burr-looking vegetable plant about the size of the old fashion thistle but with a different sort of "sticker." They are imported from France, and strange as it appears, in all the labyrinth of springs, rods, rolls, eccentrics, wire brushes and all that one finds in a woolen mill, it is said that nothing has ever been invented that can compare with the artistic finish that the teasles can give to a piece of woolen cloth. This done, a blanket is put in stock and ready for the market.

Those employed number 13 in all. One engineer, one washer, one dyer, one at the picker and teasle machines, three at the three looms, two spinners, one for each machine, and one for two carding machines, and the three Messrs. Whitfield make themselves exceedingly busy in any department, or at any machine, as the conditions of operation demand.

One of the most substantial testimonials that came to the ears of the Bureau's agent was that given by the manager of one of Big Timber's largest general stores who said that it was with difficulty that he could dispose of the Eastern blankets he had in stock. The demand is for the home product, not, however, merely because it is a home product, but because the local article is by common consent awarded the prize as being the best for the money that has ever been offered the consumers of that locality. And during this conversation this manager interrupted himself to give orders to his clerks to "Run those — Eastern blankets off at any old price."

Thus it appears that an innovation has been made that, carried to its logical conclusion in Montana, will save to its people the enormous amount of over \$1,000,000 of economic wealth each year that heretofore has left our borders to enrich the monopolists of transportation and manufacture in other states and, to some extent, other and foreign parts of the world.

DREDGES.

THE DREDGING SYSTEM OF WORKING PLACER GROUND.

It is not quite truthful to classify dredging with the "New Industries," and thereby imply that it had its inception within the last two years since the Seventh Report of the Bureau was published. On the other hand it can be said that the most perfect appliances now in use and which guarantee the permanency of the industry as a vast wealth producer to Montana have very largely come about since the beginning of 1900, and it is upon this ground that the seeming impropriety may be excused.

The dredging system of working placer ground has necessarily been in an evolutionary stage since it was attempted in Montana. The idea is said to have been imported from New Zealand, where it had its inception some 20 or 30 years ago, and from whence it came and first took root in this country in California where it was utilized for working the soft, sandy-beach, alluvial deposits and thence spread to various sections of the United States. The modern dredge is but an elaboration of the old-time steam shovel and, as one can readily surmise, many difficulties and some failures have inevitably been encountered in the course of attempts to adapt it to the particular character of the demand. The special design of machinery equipment that may be appropriate for certain purposes may not be practical for other uses and in the beginning it is most natural that an operator should be partial to such mechanism as has faithfully served him at some former time although he may meet with surprise at his error in attempting to adapt his most familiar and trustworthy appliances to other and varied conditions, such as those of the soil to be handled, for instance. The distinctions in conditions and requirements are often of such a character that they cannot be anticipated and, therefore, methods and appliances are necessarily the outgrowth of ingenuity and experiment on the part of those having the enterprise in charge. In fact, this is the road that the steam shovel has had to travel to develop into a mining dredge and it is to the credit of our State that nowhere has the evolution been more ingeniously worked out than in Montana. Those in charge of the operations of this promising industry have encountered its difficulties with composure, borne its vexations with forbearance and striven and strided to new achievements through perseverance, genius and technical scientific knowledge. These are the men whom, from the inception of the industry to the close of the season of 1902, nature's strong boxes have been made to yield, at a conservative estimate, \$1,125,000, and there are millions yet to come.

In the preparation of this data the Bureau is indebted to Mr. Eugene B. Braden, manager of the American Smelting and Refining Company's plant at East Helena, for access to an article prepared by him in 1897 from which a liberal quotation has been taken relating to the dredges of Beaverhead county, and all the data that is here published in regard to traction dredges.

Also an obligation is due to Mr. F. C. Kress of the Dillon Examiner, for verified data that he has placed at the Bureau's disposal relative to the industry in Beaverhead county. To Mr. Julius Baier, assistant manager, who is in active charge of both the construction and operations of the magnificent gold winning wizards of the Conrey Placer Mining Company, the Bureau desires to make appropriate acknowledgment for his painstaking contribution.



The Inscription under the Illustration on page 433 should read:

FIGURE 1—VIEW OF NO. 2 DREDGE JUST BEFORE "LAUNCHING," INSTEAD OF LANDING."

suggestion was made that the dredge system which was so successfully in use in that work could be likewise employed in the handling of the placer beds of Grasshopper creek. The proposition met with favor and an examination of the Bannack diggings was made, with the result that the project was regarded as feasible and an option was at once secured on a considerable portion of the placer ground in that vicinity. That gold existed in paying

quantities on bed rock was self-evident as, upon every bar which had been mined in early days, and none were overlooked, good pay was found. In nearly every place the rim-rock was also worked and a great deal of drifting was done as well. The rock bed was too deep to be worked by the old-time sluice box or ground sluicing methods and the best of the gold was still found on the bed rock beneath 35 feet of gravel.



FIGURE 2.—SHOWING NO. 2 DREDGE IN OPERATION WITHIN THE DAM.
(Property Conrey Placer Mining Company, Ruby, Madison County.)

The machinery of the F. L. Graves was ordered in 1894 from the Bucyrus Company of South Milwaukee, and the boat was launched in the spring of 1895. Power was supplied from an electric plant situated in the lower part of Bannack where the boat was set at work. The electricity is generated by water power from a ditch which, with all its branches is 62 miles long, and the services of two men are required in patrolling it throughout the season to keep it in repair. This boat was built with the idea of pumping up the gravel and gold by suction, but this system brought all the lightest materials to the surface, while the heavier ones, including the gold, were left on the bed rock; therefore, for the first season this boat was a failure, and all attempts to remedy it on these lines failed. In 1898 it was rebuilt with the bucket-elevator, double-lift system in use, and from that time to the present there has not been a shut-down except to repair temporary breakages.

This dredge has a capacity of 2,000 yards of gravel per day, and it will

dig an average of 1,500 yards of gravel daily throughout the season. It requires three men, a motorman, pilot and deck hand on each shift to operate the boat. The bucket chain is equipped with 36 buckets, each having a capacity of five cubic feet. The ladder upon which they work is so arranged that three of the buckets are always digging in the gravel and the speed of digging is generally 10 buckets per minute. The gravel is dumped into a rotary hopper which screens out all the coarsest gravel which passes off into the pond at the side of the boat. Everything that will not pass through a screen 4x5 inches, is dumped into a submerged hopper from which it is pumped by a 12-inch centrifugal pump into the sluice boxes where the gravel is washed over riffles similar to the means used in early days. The dump is at the rear of the boat and the platform upon which the sluice boxes are supported rests on scows. A big rubber pipe called a "rubber neck" joins the sluice boxes with the boat. The water for washing the gravel is pumped up with the gravel through the 12-inch pump into the sluice boxes. The sluice boxes are made of pressed steel. The buckets are of pressed steel with a movable lip which can be replaced when worn out. Each bucket and link weighs 1,200 pounds and the safe breaking strain of the link is 720,000 pounds. Since this boat was launched it has worked a mile of the creek bed which has averaged 30 feet to bed rock. It is estimated that in going this distance 2,500,000 cubic yards of gravel have been moved, or an average of 500,000 yards each season. The past season has been a very profitable one for the F. L. Graves, and there is pay ground enough ahead to run it for two seasons more, when it will probably be dismantled and sent to another field.

The A. E. Graeter was launched for the Bannack Dredging Company in June 1897. Mr. Braden in that year wrote the following description of this boat:

"It is 102 feet in length, 36 feet in width and draws about three feet of water. The framework is of heavy timbers, closely braced, and, together with the engines, boilers, and other machinery carried, the total weight is nearly 700,000 pounds. Preparatory to the launching of such a dredge a dam is built across the gulch so that sufficient water is impounded. When operations commence the gravel, when washed, is deposited behind the dredge which moves up the gulch into the excavation thus made. Steam is generated by two tubular steel boilers of the locomotive type, with grates arranged to use pine and fir wood for fuel. These boilers have 125 horse power capacity each. Immediately back of the boilers is placed a set of engines which drive the buckets, raise and lower the bucket ladder or frame and run the guy lines, which are attached at the front of the dredge and anchored outside so that the dredge can be swung in a circle for digging purposes on the "spud" at the rear end of the boat, which acts as an anchored pivot. This set of engines is under the control of an engineer stationed in a pilot house above the upper deck. From this post he has observation of all operations and handles the machinery accordingly by means of a set of levers connected with the engines.

"Directly in front of and below the engineer is the ladder on which an endless chain of 36 buckets for digging is worked. These traverse this ladder,

the lower end of which is vertically adjustable as to depth by means of suspensory cables passed over a frame above and wound upon a drum at the engine and under control of the engineer in the pilot house. This ladder is swung at the upper end upon a permanent 4 3/8-inch horizontal shaft and permits the buckets to excavate gravel to a depth of 38 feet. This shaft is driven by a sprocket and chain connection with a 75-horse power engine. Between the bearings this shaft is fitted with a pulley having five faces or wearing plates to fit the links of the chain carrying the buckets. Through this the motive power is communicated to the chain and buckets for digging in the gravel. This chain is swung loose on the under side so that each bucket has a horizontal drag of eight feet through the gravel and its loading accomplished as it passes over the pulley fixed into the lower end of the frame similar to the drawing pulley above. The lower one, however, is provided with six faces to fit the links and is flanged to prevent lateral motion or slipping off of the chain while working. The loaded buckets pass up the ladderway, which is fitted with steel rollers at short intervals for carrying the load, and empty themselves into a hopper when traveling over the upper pulley. The buckets and links are made of annealed Bessemer steel with the rim and other parts exposed to wear riveted on so that renewal of them can be made from time to time. The links are two and one-half feet long, each alternate link being cast with the bucket. Because of the gravel the Robinson patent protected joint provided with rubber guards is used for the bucket chain connections. These have a bushing of hard steel working on a stationary pin of soft steel besides, and other devices to reduce the actual wear of the cast link to a minimum. The buckets have a capacity of five cubic feet and travel at the rate of 14 feet per minute.

"The dredge is equipped at the rear end with two "spud" timbers 42x18 inches by 50 feet in size, weighing over 11,000 pounds each. They are each fitted with a pointed steel wearing shoe at the lower end and with the necessary gearing for raising and lowering. These "spuds" are for moving the dredge forward or backward, being alternately raised by means of hoisting cylinders of 24 tons capacity and dropped after the dredge has been swung by the engineer in the pilot house through the cables passed around the front corners of the boat to a lateral anchorage. The boat is thus walked ahead. While excavating, one of these "spuds" rests in the gravel at the bottom and forms a pivot around which the boat is swung as the gravel is taken up. By means of the suspensory cables carrying the bucket ladder, this ladder is lowered about six inches with each swing of the dredge around the anchored "spud." Thus with the drag of the bucket a segment of gravel six inches deep and eight feet wide is excavated. This lowering of the ladder continues until bedrock is reached. The bedrock, if yielding, is torn loose and brought up until barren of values.

"Strong jets of water are introduced into the hopper in which the gravel has been dumped by the buckets in passing over the upper pulley. The mixed gravel and water feed themselves by gravity into a revolving screen or trommel and additional water is introduced. This trommel is 12 feet long, 48 inches in diameter and inclined 3 inches to the foot. The perforations are

1 1-2 inches in size. The larger rocks are separated from the finer gravel and sand and passed out at the lower end of the trommel into the water at the side of the dredge. The finer material drops into a second hopper which is swung below the water level by chains near the center of the dredge. This hopper is reduced in size and continued in a 15-inch suction to the centrifugal pump. This pump is of the Fred K. Prescott type and discharges the pulp that has been passed into the suction to the sluice box located on the upper deck. It is run at a speed of 250 revolutions and has a capacity of from three to five thousand gallons per minute. In passing through this centrifugal pump the gravel suffers final disintegration of any clay or cement masses contained and effects a complete freeing of the gold, 98 per cent of the originally contained gold being saved in the sluices. The dredge is also equipped with a Dean pump of large capacity which supplies the water to the hoppers and trommel and by it jets of clean water are introduced to the bearings within the centrifugal pump to free them from gravel and prevent consequent heating.

"There are two sluice boxes. The first begins on the upper deck just back of the pilot house and is 30 feet in length, 30 inches wide and 40 inches deep. It discharges into a lower sluice box which is 56 feet long projected beyond the dredge and suspended by cables from an "A" frame. These sluice boxes are of steel and fitted with a false bottom of square steel plates separated some three inches so that the heavier gravel and stones which have been freed of all clinging gold do not pass over and cause excessive wear to the riffle boards. The weight of this suspended sluice box on the "A" frame when carrying the discharge from the pump is 36,000 pounds. This sluice at the lower end where the tailings are abandoned can be swung laterally by means of cables to deposit these where desired. To overcome the tipping that might be occasioned by this lateral swinging, the dredge is supplied with two boxes, each 42 feet long, 12 feet wide and 42 inches deep, located lengthwise of the boat under the lower deck. Water is pumped into the opposite box when it is desired to swing the sluice laterally and overcomes the tendency to tip the dredge.

"The A. E. Graeter is provided with an electric light plant, thus enabling operations to be continued day and night. Eight men are required to man the dredge during each shift. The cost of working the gravel on this dredge where steam is employed has been found to be nine cents per cubic yard. This includes labor, supplies, running repairs and superintendence. On the F. L. Graves, where electricity is employed for power, this cost has been four and one-half cents per cubic yard."

Since this boat was launched on April 17, 1897, although it was not started up until the Fourth of July of the same year, it has averaged 375,000 yards of gravel each season. During the season of 1901 it dug over an old tailings dump which was piled 20 feet on top of the original creek bed. This gave it a depth of 50 feet to dig to bed rock, but this performance was easily accomplished. Six men are now employed on each shift, two less than formerly. About eight cords of wood are consumed each day in making steam. Cleanups are made twice a week, the boat shutting down for half a shift for that purpose.

Among the riffles in the sluice boxes of the Bannack dredges is always found a large quantity of black sand and iron rock. This is carefully saved and at the end of each season shipped to the smelter at Omaha. The value of the iron rock varies from \$35. to \$185 per ton. One season 35 tons of this material was saved.

Quite a number of relics of the palmy days of Bannack have been recovered from the sluice boxes of these dredges, among others being a heavy 18-karat gold ring. The company has a cabinet in its office which is filled with these relics consisting of coins, cartridges of all kinds, medals, a part of an old pistol, curious nuggets, belt buckles, and a hundred different articles. The oldest of the coins is a ten-cent piece dated 1826; another old-timer is a fifty-cent piece dated 1833. At a point which is said to have once been the site of Henry Plummer's cabin a cache was evidently encountered as the buckets brought up 10 one-dollar gold pieces, nine \$2.50 gold pieces, one \$5 gold piece and three 50c silver pieces. The majority of the coins are dated from 1858 to 1861, although there are a few of recent years. The largest nugget ever taken out was egg shaped and weighed \$150.

The dredge that was built by the Bon Accord Mines, Limited, differs from the A. E. Graeter in that the ladder is swung above the deck and the excavated material was discharged from the buckets into the hopper connecting with the trommel located on the deck. After being agitated with water the pulp passed into the sluices. This arrangement obviated the use of the centrifugal pump and, being an experiment at the time, was watched with interest. The doubt was as to whether sufficient disintegration would be thus accomplished. Time, however, has demonstrated the success of the experiment and this feature is coming to be generally adopted. After three years of rather spasmodic operations this dredge was sold and taken to the John Day river in Oregon.

The John C. Brenner takes the name of its manger who is operating a dredging property at the head of Horse Prairie creek in Beaverhead county. Beyond the fact that this company has had a successful season during 1902 and the claim made that there is pay ground enough ahead to last it many years, nothing could be learned as it has been impossible for the Bureau to send a representative there or to get reliable information otherwise.

The Conrey Placer Mining Company have in operation in Alder Gulch, near Ruby, Montana, two boats—the "Gordon" or dredge No. 1, and dredge "No. 2." Another boat, the Maggie Gibson, formerly used at Bannack, is operating on the company ground under lease, by the Chicago Mining & Development Company.

Dredge No. 1 was built by the Vulcan Iron Works, of Toledo, Ohio, in 1899, and was put in operation in the fall of that year. It was soon found that the ground was of an unusually compact nature, and though the dredge was apparently built of the same strength as dredges operated successfully in other places, it was unable to dig the gravel without continual and excessive breakages. After some repairs and another season of similar experience, the dredge was practically rebuilt, all the weak points were thor-

oughly over-hauled and strengthened to a standard required by the ground, and since that time it has been operated with exceptional success.

Dredge No. 2 was built by the Conrey Company themselves, and put in operation in July, 1902. In its construction was embodied the experience gained from the first dredge. Everything was built of ample strength, and it has worked successfully from the very start.

Both these dredges are of the single-lift, chain and bucket type, and differ from each other mainly in their capacity. On the No. 1 dredge the buckets hold 6 1-2 cubic feet, and on the No. 2 dredge they hold 10 cubic feet, each. (Fig. 1 shows the No. 2 dredge just about when construction was completed and previous to water being let into the dam to float it. Fig. 2 shows the dredge beginning operations within the dam, which was constructed to float the boat).

In operation the material brought up by the buckets is dumped into a hopper, and thence washed by a 10-inch stream of water into a revolving grizzly, or trommel, with holes about four inches square. The larger gravel and boulders come out of the end of the grizzly and fall onto an inclined rock chute, placed crosswise of the boat, which guides the stones back into the pond and underneath the boat. The smaller gravel, sand and gold fall through these holes into a sluice box which begins underneath the grizzly and runs to the rear end of the boat, and discharges into a flume 126 feet long. This flume is supported on an independent pontoon, is fastened at one end by a swivel joint to the end of the boat, and the other end swings free from side to side as the pontoon floats in the pond. In the sluice box and flume are the riffles—of various types of construction—which save the gold by means of quicksilver.

Instead of a spud to hold the boat in place, there are four cables or "mooring lines," 500 to 700 feet long, which radiate from the top of a frame built firmly in the rear end of the boat. On top of this frame is the "mooring head"—a spindle supported by a ball-bearing on a base plate bolted to the top of the wooden frame work. The spindle supports four sheaves, over which the four mooring lines are run out. These lines are anchored at one end firmly in the ground, pass over the sheaves in the mooring head, and thence over various guide sheaves to independent winding drums, to which they are fastened. When it is desired to move the boat ahead, two of the lines are wound up and the other two are let out. The lines are then clamped and the mooring head is thus held in a fixed position. The forward end of the boat, with the bucket chain, swings sidewise in an arc of a circle about the mooring head as a center. At one setting the boats will work a circular piece of ground about 225 feet wide and 10 feet ahead, and to a depth of 30 and 37 feet respectively below the water level. The flume swings about the same center through a reverse arc of about the same length, and deposits the material at the opposite end of the pit dug by the buckets. The boat thus floats in an artificial pond of water, which is constantly being enlarged at one end and filled in at the other, so that the pond and the boat traverse the ground together.

The boats are equipped with engines, boilers, pumps, gearing and levers

--all suitable for the work required of them. The water for washing the gravel is pumped into the sluice box by large centrifugal pumps, carries the material at the opposite end of the pit dug by the buckets. The boat thus is thus used again and again for washing the gravel. The only appreciable loss of water is due to seepage, and this is replaced by a small supply brought by a ditch.

The small amount of new water required, in connection with the fact that no appreciable grade is needed, makes inland dredging peculiarly applicable to areas of gold-bearing gravel which, owing to their location, could not be worked by ordinary hydraulic methods.

The company owns all the placer ground in Alder Gulch, beginning at a point about three miles north of Virginia City and running nine miles in a northerly direction down the gulch about three miles below Ruby, comprising in all about 2,000 acres of land, more than 1,000 acres of which is good placer ground. Only about 25 acres have been worked out since the dredging was started in 1898. This year has returned the most satisfactory results of any year since the inauguration of the enterprise.

The French Gulch Dredging Company, of which Hon. W. R. Allen is manager, is operating in French Gulch, 20 miles from Anaconda, in Silver Bow County. The "Mildred" was installed in 1900, and was in active operation during the seasons of 1901 and 1902, without important interruptions. This dredge is one of the Postlewaite type, made by the Risdon Manufacturing Company, is single lift with buckets having a capacity of three and one-half cubic feet. From the buckets the gravel goes to a cylinder grizzly which screens to one-half inch and from there is carried to distributing tables which automatically distributes the material to 16 Evans gold saving tables, eight on each side. This is the only dredge in the State which also utilizes gold saving tables, but in this instance they have proved a wonderful auxiliary. The chain has 39 buckets and the actual capacity for moving ground is at the rate of about 1,000 yards per 24 hours though the theoretical capacity is 2,500.

When the early fortune hunters drifted into Montana in the 60's, French Gulch was one of the noted gold fields. It was discovered in 1864. During the next five years it has a record of having produced \$5,000,000 in gold dust and nuggets. Some placer mining has been done each season since in a desultory way until about three years ago Mr. Allen succeeded in bringing about a consolidation of interests under one ownership and made arrangements to open up the old diggings in a systematic and modern way. Eight hundred acres are brought under the consolidation. The cost of installing the plant was about \$40,000 and the cost of operation, including interest on the investment was this year less than five cents per cubic yard of gravel handled. Some distance above the dredge Mr. Allen has in operation an Evans hydraulic elevator, having a capacity of 1,000 yards of gravel daily.

There are about 240 acres of land in this tract which has been worked through by the old and crude way of pick, shovel and sluice box, but modern improvements such as the hydraulic elevator will enable all of this ground to be worked over again at a very handsome profit.

This property is supplied with water from a ditch seven miles in length,

which cost \$10,000 for construction. The working life of this ground is considered to be about 30 years.

About one and one-half miles further up to gulch, Mr. Allen is operating other placer mines with three bed rock flumes, using two 3-inch nozzles for washing down the banks. The banks are 30 feet deep with a great many large boulders weighing from 1 to 12 tons. A traction and steam derrick is used for hoisting these boulders out of the workings.

The gold on this ground is very coarse owing to the fact that it is near the source. Nuggets are frequently taken out weighing from \$10 to \$50.

The water supply to these mines is brought from American gulch through a ditch two and one-half miles in length. There is about 50 or 60 acres of unworked and virgin land and if worked to the highest capacity will last for 25 or 30 years.

THE TRACTION DREDGE.

Mr. Braden says of the traction dredge:

"The traction dredge or land mining machine at Washington Gulch has been designed to work in ground that is unusually flat and where but little water is obtainable. It is owned and operated by W. M. Johnston & Company, of Chicago, who also designed the plant. The builders were the Marion Steam Shovel Company and the Gates Iron works. It works dry gravel and where the machine cannot sufficiently clean the bed rock this work is done by hand labor.* The entire plant is supported on four bogie trucks which, moving on double tracks 12 feet apart, laid on the bed rock. No jackarms, side braces or spuds are used. Steam is supplied by one 50-horse power boiler and a set of dredge engines of the same capacity. These perform the excavation, handle the car, run the washer and trommel and move the plant forward when required. That part of the machinery by which the excavating is accomplished is similar in design to that used for such purposes on steam shovels. The boom is 40 feet long and carries a dipper or shovel of one and a quarter cubic yards capacity and handles 70 cubic yards per hour. The water supplied to this plant for all purposes is 20 miners' inches.

"In this gulch the bed rock lies some 16 feet below the surface. Above this is the auriferous gravel on which is a considerable overburden of barren material. This latter is first stripped off and disposed of at the side without washing. The pay gravel is then taken up by the shovel and dumped into a car at the other side of the plant which runs on an incline. One end of this incline rests on a shoe set in solid ground on the bank of the cut and the other terminates on the roof of the dredge. The car, when filled, is hauled up by a cable operated by the engines and dumped into the hopper on top of the plant. The gravel passes into the washer and trommel where complete dis- This sluice extends some distance behind the plant, being carried by suspension of the plant. The finer gravel, sand, gold and water pass through perforations of the trommel into a sluice box originating immediately below. This sluice extends some distance behind the plant, being carried by suspension of the plant. The saving of gold accomplished in this system is 97 and 98 per cent.

"The water for the plant is supplied by a flume and delivered to the dredge by means of a cotton hose. Near the end of the sluice box is placed a sand valve which separates the sand and gravel from the water and drops them underneath. These form a dam which prevents the water entering the pit in which the plant rests and permits the bed rock to be kept dry. In this system the tailings are readily disposed of by gravity alone, and this has been accomplished with great facility whether the dredge is working on a down, level or an up grade. The machine has made a cut 40 feet across and 16 feet deep, moving itself ahead seven feet when desired. It has been operated 10 hours every day since May 18th, with the exception of Sundays and one day while awaiting material with which to make repairs. Eight and sometimes nine men have been employed, three of whom do the work of cleaning the bedrock by hand. About 1 1-2 cords of wood are used for fuel during each run of 10 hours.

"This dredge is the first machine of this design to be constructed. Others are being built which will embody improvements which have been suggested by the work done here. It is believed that there is ample elasticity in the design of this plant to meet successfully all requirements for working dry ground."

OTHER DREDGES.

The Western Montana Placer Mining Company put in a chain and bucket dredge at Martina, Montana, on Nine Mile Creek, Missoula County, in April 1900. The results of the operations are not known to the Bureau owing to the fact of the impossibility of sending a representative to it, but the boat was moved to Delta, Idaho, in October, 1902, which would suggest an unprofitable undertaking at Martina.

During the season of 1897 a suction dredge started work at Montana City, near Helena. The plan was to clean the bed rock by sluicing the material into a depression where the suction had its intake and thus raised it to a set of centrifugal pumps from which it was discharged to the sluice boxes for final washing. As far as can be learned the operations of this dredge were not successful.

CORUNDUM.

MONTANA CORUNDUM COMPANY.

The property of the Montana Corundum Company was located in February, 1901, and consists of four claims and the mineral rights in 3,000 acres of agricultural land. The mine is located 23 miles south from Belgrade and about an equal distance southeast from Bozeman in one of the oldest settled districts in the State, chiefly occupied by farmers and stockmen. The ground upon which the corundum was discovered has been used as a stock range for nearly 30 years and in the last 10 years no doubt hundreds of people have passed over the "float" crystals without stopping to inquire their nature. In fact it is owing to the merest accident that Montana at this date can claim one added asset to her already varied resources and the story briefly narrated is that a farmer and prospector named John Griffin came into a drug store at Bozeman one day in the winter of 1900-1 and purchased a bottle of Syrup of Figs. Mr. Frederick L. Kline, who had only a few months previously sold out his drug business at Hoopston, Ill., was temporarily employed as prescription clerk in the Bozeman drug store and he it was who supplied the wants of Mr. Griffin in the matter of the famous patent medicine, whereupon Mr. Griffin took a crystal from his pocket and sought Mr. Kline's opinion as to its identity, saying that he had never seen anything like it and it had attracted his attention by reason of its hardness, at the same time exhibiting the blade of his pocket knife in which he had engraved his initials. This was the incident that led to a careful search by Mr. Kline in the vicinity from which the crystal was found until a vein of corundum was definitely located, for he, being familiar with the mineral, recognized it at once. Mr. Kline enlisted the interest and aid of some enterprising gentlemen and active development work was started. A shaft 85 feet deep was sunk and from the bottom of this a drift to the west 165 feet long has been run on the vein, and 72 feet east, both shaft and drift exhibiting mineral at almost every foot of the way, the vein measuring between walls from 26 to 48 inches wide, with a pay streak varying from 14 inches up to 42 inches in width, probably averaging between 24 and 30 inches, and carrying a value of corundum uniformly over 20 per cent, although there is a considerable amount of ore that will run 85 per cent. A stope has been started in the east drift. Another shaft 60 feet deep about a mile west runs from 12 to 18 inches in width; a tunnel 170 feet long with cross-cut cuts the vein. This tunnel is 700 feet lower than the outcrop at the shaft. Numerous lesser shafts and surface cross-cuts have prospected the vein for a distance of 1,000 feet on the east hill, together with pits over a distance of one and a half miles, have demonstrated its continuity and value. It has been estimated that there are 100,000 tons of ore in sight that will yield 20,000 tons of pure corundum. Six hundred tons have been mined and are awaiting the completion of the mill to be treated.

Development work at Section No. 23 shaft opens, ready for stoping, a year's supply for the mill, where it will be taken direct from the stopes.

The general formation about the vein is gneiss, as in North Carolina and Canada, and the intrusion of this rock has raised up the shales, quartzite and limestone. A line of faulting has again thrust the gneiss to the north up and over these beds. The vein has a dip of about 65 degrees, and the



THE BEGINNING OF CORUNDUM MINING IN MONTANA.
(Corundum Ore on the Dump to the Right.)

filling between the walls consists of white feldspar, probably albite, which carries the corundum crystals, a greater or less thickness of vermiculite and a margin at either wall of vermiculite, or the so-called yellow chlorite of the North Carolina deposits.

A mill for crushing and concentrating the ore was brought to completion in November, 1902. This improvement cost \$24,000. It is equipped with a 10x16-inch Blake crusher, two sets of 14x17-inch rolls, screens for sizing the ore; one double two-compartment and one single two-compartment jigs; one Pratt-Wetthey separator and mullers from which the ore passes to two Bartlett rubber-top concentrating tables; a dryer from which the mineral goes through graders sizing it to 20 different grains and flours from 12-mesh, the coarsest, to 200-mesh, the finest. The 70-mesh to 200-mesh clean corundum is placed in 100 pound sacks which are lined with heavy elastic paper and an outer 10-ounce duck sack. For the coarser only the one sack is used in shipment.

The power is generated by two gasoline engines, one a 16 and the other a 54-horse power of Fairbanks, Morse & Company's make.

The quality of the product of this mine has been favorably passed upon by eminent authorities. About 20 pounds of the crystals were sent to the president of the Detroit Emery Wheel Company, who made a six-inch wheel and, after giving it a thorough test, pronounced it the best corundum he had ever seen.

After the president of the Chicago Emery Wheel Manufacturing Company had given the property a personal inspection and tested the product, he said: "Gentlemen, you undoubtedly have the coolest cutting abrasive that has ever been offered for sale."

The average value for the product will run from \$140 to \$150 per ton, but it is proposed to limit production to about three tons per day. About 25 men will be employed at Montana miners' and millmen's wages. The Company is capitalized for \$300,000 divided into shares of \$1 each. The officers are Harris Kirk, president; E. A. Stiefel, vice president; F. L. Klein, secretary; George Cox, treasurer, and L. S. Ropes, general manager. General office, Bozeman, Montana.

THE BOZEMAN CORUNDUM COMPANY.

Corundum was discovered April 15, 1902, on Section 31, owned by J. V. Blankenship, located 14 miles southwest from Bozeman. The Bozeman Corundum Company was organized and purchased the minerals and mining rights on the section and active prospecting and development began. Five men are employed. Five shafts have been sunk and 30 feet of drifting done; also two tunnels have been run, one 35 and the other 100 feet long. Good showings of corundum crystals have been developed in each of the seven veins running in various directions through the company's property. One vein in particular is said to yield a specially good quality of the mineral known as ruby and sapphire corundum, and, in fact, there have been quite a number of rubies and sapphire gems found in this vein, some of which are very good indeed. Two which had been cut were exhibited to the Bureau's agent, one of which was worth between \$15 and \$20 and the other about \$10. In this property there are also by-products of gold and silver.

In the valley at the foot of the hill where a portion of the claims are located the boarding house is situated. A well 140 feet deep was sunk for the purpose of securing water for domestic use and by a very fortunate circumstance an extension of one of the corundum veins was encountered at this depth, thereby demonstrating the permanency of the vein at a depth of something like 300 feet from the altitude where it was laid bare on the hill. The average pay streak of all the veins is said to be over 14 inches. Mr. H. E. Miller, president of the Chicago Emery Wheel Manufacturing Company, personally inspected the property, sent the mineral to Boston for test and reported it a first-class product.

The property only having been located within the year, sufficient time and opportunity have not been had in which to make exhaustive tests, and, therefore, authoritative statements beyond the foregoing cannot be ventured, but in every appearance the property is destined to become a profitable

corundum mine. This company is also capitalized for \$300,000; shares \$1 each.

Mr. E. V. Blankenship is president; J. V. Blankenship, vice president; Frank Maxwell, treasurer; H. H. Holloway, secretary; and M. S. Rickman, general manager. General office, Bozeman, Montana.

CORUNDUM ECONOMY.

In the year 1901 only 205 tons of corundum was produced in the United States, all this amount coming from North Carolina and Georgia. The market for abrasives in this country requires from 12,000 to 15,000 tons of material yearly, and the balance of the demand was, in 1901, met by imports from Canada. The yearly demand is made up about as follows:

Emery, 4,200 tons, value	\$189,000
Garnet, 3,285 short tons, value	92,801
Carborundum, 1,200 tons	216,801
Adamite (Imported in 1901)	
Crushed steel	
Carborundum, 1,200 tons	216,090
N. C. Garnet, 625 tons	21,200

Emery is a natural mixture of iron oxide and corundum, the latter being the cutting quality of emery and varies from 33 to 50 per cent.

Garnet is used largely as a cheap substitute.

Crushed steel is used for grinding purposes to some extent.

Carborundum is a manufactured product composed of carbon and silicon, the market price of which is eight cents to 10 cents per pound and is consumed by the makers.

A large amount of crushed quartz is also used in the manufacture of sand paper and cloth.

Adamite is a manufactured product imported from Belgium and is considered a fair abrasive for certain classes of work, but more expensive than corundum.

France, Germany and Japan use 28,000 tons of abrasives a year and England and Belgium use a considerable quantity of the best, such as the Montana product has been both theoretically and practically attested to be.

There are 36 extensive concerns in this country who manufacture emery and corundum wheels, several of which consume 30 tons per month each.

Thus it will be seen that the mining of corundum is destined to become an important industry of the State that will leave its quota of wealth among her citizens.

TIE PRESERVING PLANT.

The Great Northern tie preserving plant at Somers, Flathead County, was completed in June, 1901, and began operations on the 7th of October of the same year. From that time until August, 1902, about 1,000,000 ties had been "pickled," as is said of the process in common parlance. The plant is located about three-quarters of a mile in an air line from the John O'Brien Lumber Company's saw mill. The latter company saws the ties—most of them in triangular shape—and delivers them to the yards of the preserving plant by two 100-horse power electric motors. At the preserving yards the ties are left to season for from 30 to 60 days before treatment, after which they are ready for immediate use. About 75 men are employed and the retorts are in operation day and night. Mr. William Henry is manager.

Mr. Samuel M. Rowe, civil and consulting engineer, of 226 LaSalle street, Chicago, is the author of the process as well as the designer of the works at Somers, and to him the Commissioner here takes occasion to make appropriate acknowledgement of his gratitude for the painstaking paper which has been prepared and contributed upon this technical subject by Mr. Rowe, which reads as follows:

These works were planned with a capacity to treat an equivalent of 4,000 cross-ties per day of the standard dimensions used by the Great Northern Railway Company. The timber which is being cut for treatment is from the pines, tamaracks, firs and spruce, mainly, from the forests of the adjacent country and are largely from well-grown and large trees. As compared with the pines of the Rockies further south in Wyoming, Colorado and New Mexico, the timber is much more compact and, if anything, more resinous; hence, more difficult to penetrate with the treating solution.

The treatment provided for in construction of the works and now in use is the "Zinc-Tannin" or "Wellhouse" process, modified in one respect; that of separate application of the glue solution which, in the Wellhouse process, is applied in the same solution with the zinc chloride. This is done in consequence of the greater density of the timber.

The "modus operandi" of the process consists of first steaming the charge in the sealed retort. The air is expelled from the retort at the middle while the steam is entering at each of the ends. When the air has been mainly expelled, its vent is closed and the steam brought to 20 pounds pressure and there held until the timber is thoroughly cooked through. The purpose of this is to start the juices of the timber and dissolve all soluble matter and enable it to be expelled by the heat and by the aid of a vacuum drawn after the steam is discharged, thus leaving the timber measurably dry and in favorable condition to absorb the solution when let in.

Thus far no more effective means have been found for this, and that it does so is easily confirmed by observation. An examination of the timber

after the vacuum has been drawn, before the solution is introduced, and by the character of the condensations drawn from the retort during the process of steaming, and from the rapid rate that the solution is absorbed on first being applied, demonstrates the effectiveness of this part of the process. Drawing the vacuum is the second move in the process and this is done as soon as the steam is discharged from the retort and requires about one hour. The third movement is the introduction of the chloride solution which is done while the vacuum is still on, much facilitating the operation. The following is an approximation of the rate that the timber takes up the solution:

First half hour, 54 per cent of the total obtained.

Second half hour, 30 per cent of the total obtained.

Third half hour, 9 per cent of the total obtained.

Fourth half hour, 4 per cent of the total obtained.

Fifth half hour, 3 per cent of the total obtained.

The chloride solution used at the Great Northern works, owing to the great density of the timber to be treated, and the high requirements of the company as to the quantity of the antiseptic desired, is used in a four and one-half per cent solution resulting in an absorption of over six-tenths of a pound of pure chloride per cubic foot of timber. The absorption of the solution by volume is about 22 1-2 per cent of the volume of the timber. These same timbers when immersed in clear water and allowed to remain 30 days, absorb about 23 per cent in volume, so it will be seen that what in these cases required a month for a section four inches long is done here in a few hours where the piece is at least eight feet long. The writer has held that the above test in water is of value in determining the absorptive powers of the different timbers with reference to correctly handling them in treating, and has spent much time and expense in this direction. The above is believed to be in confirmation of this view. Similarly, the softer oaks—black, red, and water oaks—absorb 32 per cent, the mountain pines of the more southerly rockies about 40, and the loblolly (short leaf pine) as high as 50 or more.

It is easily seen that in each locality and with different timbers, the strength of the solution must be varied to meet these characteristics of the timber. In treating the New Mexico pines, one-third of a pound was easily introduced in a .015 solution and now at the expiration of 17 years some of these are still in service.

With the timbers in northwestern Montana the resins are undoubtedly the main source of difficulty in securing the desired absorption. They are very resinous and but a small portion of the resin can be extracted by the steaming. It is believed, however, that when the resins are disturbed as they undoubtedly are by the steaming, they will assist much in resisting the actions of decay and that a less amount of the antiseptic is necessary.

The chloride solution is applied under 100 pounds pressure and when the desired amount has been absorbed the balance is forced back into its proper receptacle. The glue solution (one-half of one per cent) is then allowed to flow into and fill the retorts, it being under 100 pounds pressure for one and a half hours usually. After the residue of the glue is forced back into the storage tank the tannin solution is applied for a like time and under

the same pressure. The return of the unabsorbed solutions is accomplished by means of an air compressor which forces air into the retorts thereby displacing the solution and forcing it back into its proper receptacle. These receptacles consist in each case of a 100,000-gallon tank built of wood with steel bands, set so that the solution flows to the retorts freely but requiring some 20 pounds air pressure to return it to its respective storage tank. When the tannin solution is forced back the operation is complete; the charge is withdrawn and another is introduced.



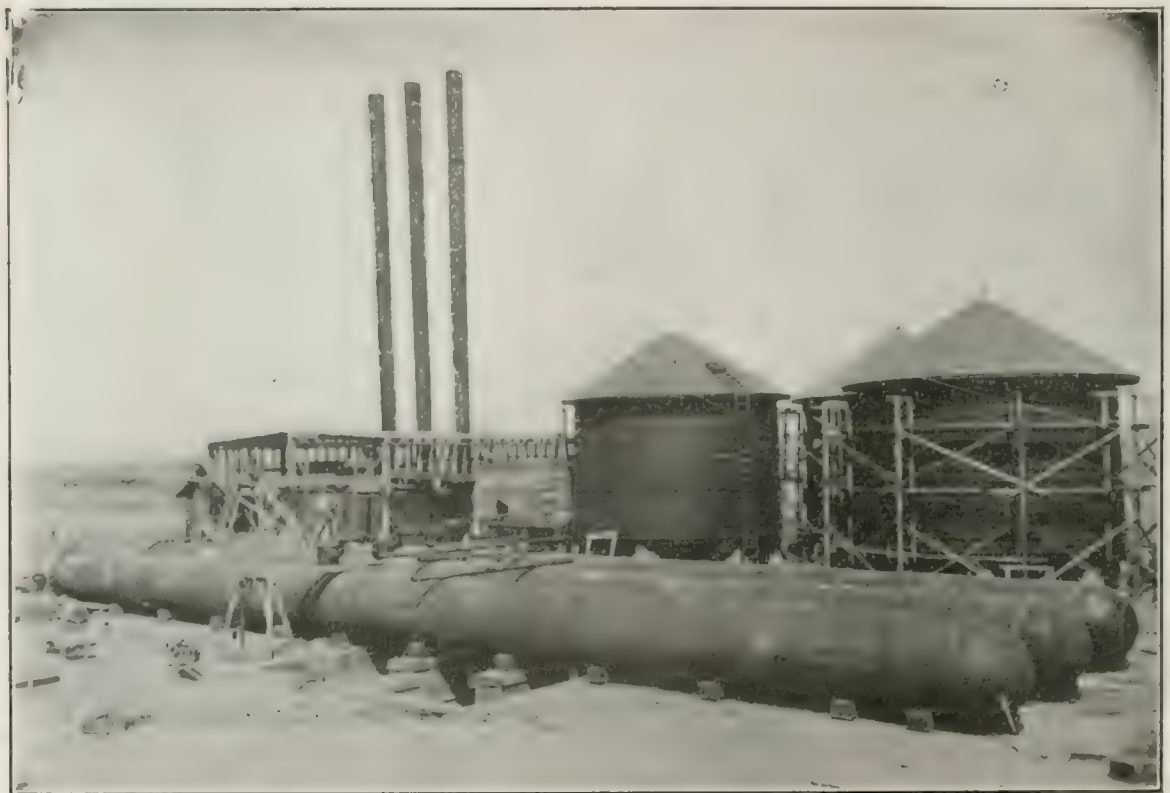
PART OF THE PIPING SYSTEM—G. N. TIE PRESERVING PLANT.

Each charge consumes, including time spent in introducing and removing it near 12 hours, so that each retort will serve two charges in the 24 hours, each containing about 500 ties. It is intended that the works are to be operated continuously, except on Sundays, during which steam boilers may be cleaned and any necessary repairs made. The buildings are substantially built with such heating appliances as are necessary to secure the machinery and pipes from frost so that it is practicable to operate summer and winter alike.

The chemicals used are the zinc-chloride, the glue and the tannin. The zinc-chloride is received usually in 1,000-pound rolls, termed "fused," being in the form of a salt nearly chemically pure which is protected by a covering of thin sheet iron. If preferred, it can be made at the works, using the muriatic acid 18 to 20 Beaume, (HCl_2), and feeding it with metallic zinc (spelter) to the full extent that it will consume. This will give near a 50 per cent stock solution much the same as is derived from the fused salt when dissolved in water. The fused product, however, is the most economical to use, the freight being much less than when the acid is shipped in carboys, with the further convenience of being ready to use, the time required to dissolve it being but a few hours.

The chloride of zinc has so far proven to be practically the best agent for retarding decay in timber. It is always highly soluble and as long as it remains in the timber, will remain active. In the Burnett process the chloride of zinc is the only chemical used, the manner of impregnation being as before described; the Wellhouse, or the zinc-tannin, only differs from the Burnett in that the glue and tannin action is added.

The Wellhouse process is based upon the theory (to what extent remains in question), that the zinc-chloride being so exceedingly soluble, combining as it does with moisture whenever it comes in contact, it was believed to be of advantage to retard the ingress of water to the wood by plugging up the



VIEW OF THREE RETORTS IN PLACE BEFORE BEING PUT UNDER COVER- G. N. TIE PRESERVING PLANT.

pores, the application of the glue solution first filling the pores and grain of the wood to such depth as it was possible to force it, then following this with the exposure of the glue to the action of the tannic acid and their combination into a "leatheroid," forming insoluble pellicles in the pores of the wood.

"The generally accepted theory of the capillary process of absorption of water when the wood comes in contact with it is probably correct. The chloride in the treated tie, being readily soluble, is dissolved by the water and is carried with it as it penetrates the wood. By the contrary operation of surface evaporation in drying out, the chloride will be gradually dropped again and finally, such of it as reaches the surface still in solution, will be deposited on its surface or in the soil in which the tie is bedded and there lost. It is very easy to see that this may result in loss and final wasting away of the antiseptic to a greater or less degree, depending upon the frequency of the exposure. In conformation of this general theory, the Department of Agriculture has made some careful investigations on alkali soils by which it is found that alkali sinks into the soil on free application of irrigating water,

allowing cultivation of the soil but when the irrigation ceases and the ground is exposed to extended drouth, the alkali again rises and the land becomes sterile as before."—(Extract from discussion page 547 Trans. Am. Society of Civil Engineers, June, 1901.—Rowe.)

In this process the penetration of the glue must necessarily be quite superficial on account of its viscosity, as in combination with water, it never reaches what would be termed a true solution. It follows then, that when the contact takes place only so much of the tannin as is to combine with the gelatine present will be consumed, that remaining will be returned with most of the water holding it in solution. Hence, we have the result that in the use of these two solutions there is a loss of so much of each in each application without anything like a corresponding loss of the water, the latter being returned to its receptacle with but little loss in volume, the loss being mainly that of the two chemical agents. From this fact the rule for adding so much of each to restore the proper strength is adduced. Whatever the value of this may be to the treatment above that of the simple application of the chloride of zinc, as in the Burnett process, the general consensus among those who have watched and studied the results is that a gain of some two years in life is attained thereby. The modification of the Wellhouse process in the treatment of the Montana timber here practiced, is the separate application of the glue solution and is predicated upon the idea that the presence of the glue in the chloride solution may retard absorption of the chloride. This lengthens the time of treatment and is controverted on the ground that the chloride is a solvent of the glue, enabling it to penetrate the timber to a greater degree, consequently serving to increase the resistance to the penetration of water. In this case, however, it was concluded that on account of the compactness and obduracy of the Montana timber, to give it the benefit of the doubt, in favor of the greatest amount of absorption of the chloride.

It is believed that the Great Northern plant embodies every one of the most approved devices for the purpose of carrying through the necessary functions of the process in the most thorough, complete and effective manner. Add to this, skilled and careful management and faithful, intelligent compliance with the rules laid down by those who have had long practical experience will secure good results and the benefits sought. That this is paramount will be well understood when it is considered that if this is not done, results are apt to be disappointing and the large expenditure of money involved in the erection of the works, in chemicals and expenses of operation will be uselessly squandered and the outcome will discredit all concerned.

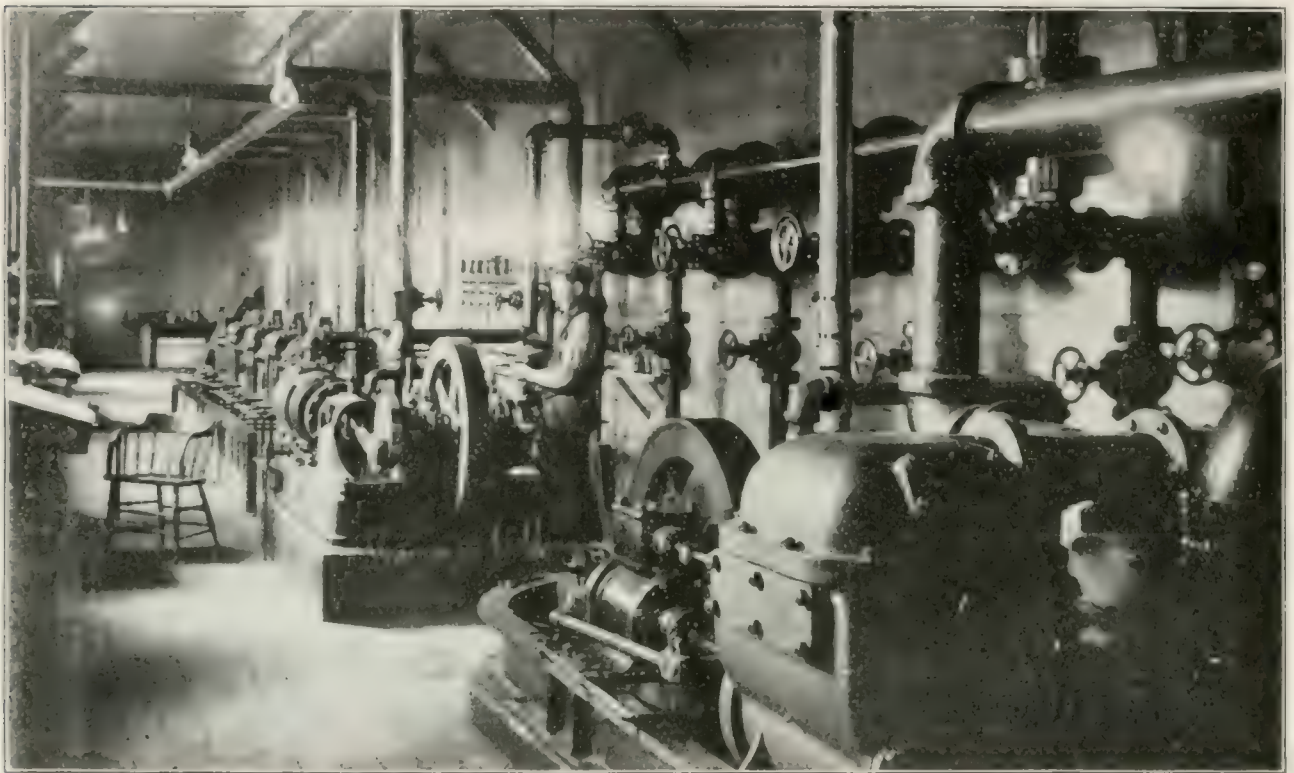
So far, this treatment has been applied to the less valuable timbers with the result of more than doubling the life. With the high class of timber now be treated at Somers at least double life should result. Experiments on the softer oaks show equally good results and this with the fact that some of the timbers usually considered worthless are rendered lasting and serviceable by treatment, opens up a largely expanded field from which to meet the ever increasing demand for railroad cross-ties.

In addition to the lengthened life, the value of the treatment is still

further exemplified by its effect in toughening the fiber of the timber by which the rail wear is resisted and the holding power of the spike increased. The tie committee of the American Railroad Engineering and Maintenance of Way Association report of 1901 gives each of these features as about 30 per cent above that of the same timber untreated.

Inspection of treated pine and hemlock ties in track under heavy traffic will corroborate this and even more as the writer has seen some treated pine ties in track 12 years still showing but little rail wear with spikes intact. The same kind of ties in track five years are often in such condition that when removed a shovel has to be used to handle the fragments.

It may be proper here to review the foregoing and to dwell

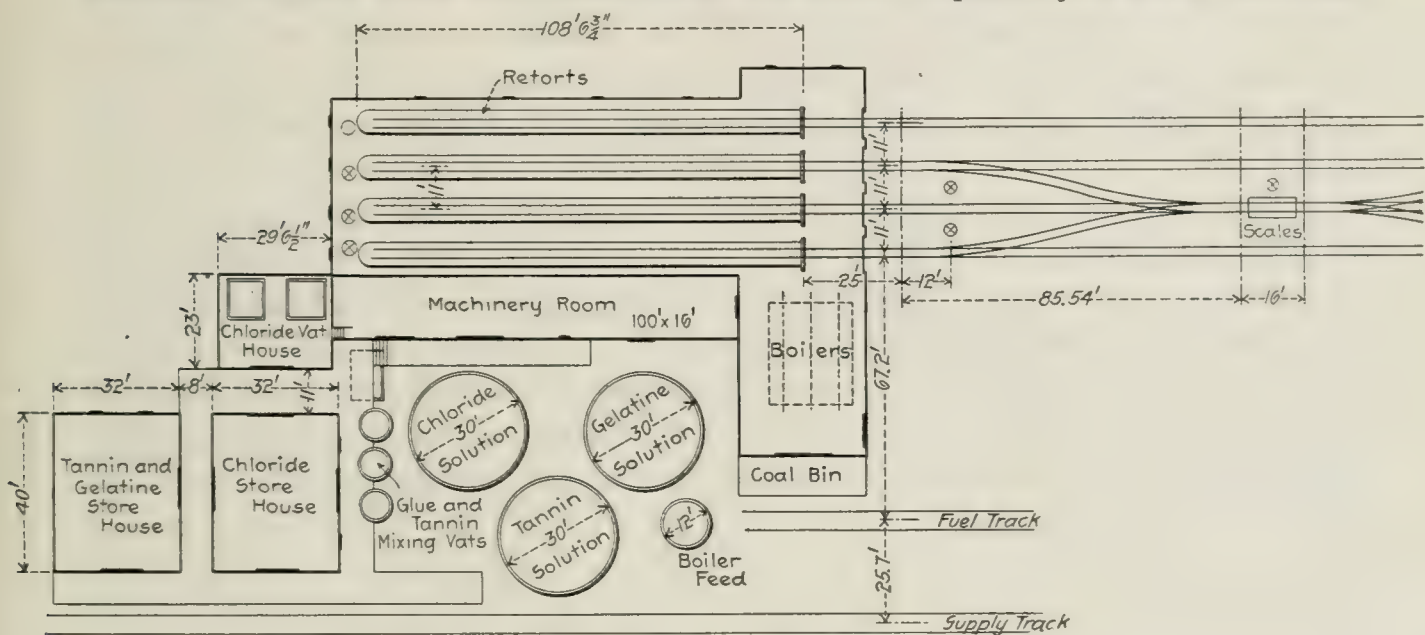


INTERIOR VIEW OF MACHINERY ROOM—G. N. TIE PRESERVING PLANT.

somewhat on the physical characteristics of the process. The first step, that of steaming, is calculated to reach in some measure the very heart of the piece. It is difficult to determine whether it does so by any means of direct measurement by instrument, but it may be done indirectly to a great degree of certainty, thus: As soon as the steam has begun to affect the timber materially—which is generally within the first hour—the condensation of the first steam which absorbs the cold from the charge, falling to the bottom of the retort, is drawn off frequently as it accumulates in considerable quantities throughout the steaming. An examination of this shows that at first no considerable amount of the juices of the timber appear. Continuing the observation from time to time, the amount of timber juices and resins are plainly indicated. This continues for some time until finally the off-flow begins to lose this character and becomes less heavy and finally almost clear condensed steam will appear, clearly indicating that the timber has been “cooked through.” Large globules of the dislodged resins

will be found in the bottom of the retort, still further attesting the power of the steam to open up the pores of the wood. In any case the steaming is the most important part of the whole process. Not only is it important that a sufficient portion of the antiseptic be put in, but a still more important matter is that it shall permeate the piece and this permeation cannot be secured unless the steam has worked the necessary change in advance of it. Of course a larger share of the antiseptic will lodge in the outer portion of the timber than reaches the center, but it is believed that owing to the fact that the chloride remains in solution as long as it remains moist that it will equalize somewhat subsequently.

That the steaming does loosen and dislodge the saps and such constituents of the wood as may be dissolved by its heat, is further demonstrated by the considerable reduction in weight notwithstanding a considerable amount of moisture derived from condensation of the steam, especially if fresh cut tim-



GROUND PLAN OF THE G. N. TIE PRESERVING PLANT.

ber is exposed to it. Thus far no other agency or process has proved so effectual for this purpose as that of steaming.

The greatest degree of heat that timber will bear without injury to its fiber is about 250 degrees Fahrenheit, equal to steam at about 20 pounds per inch pressure; hence, this is the rule governing. A little higher might hasten the operation, but with danger of scorching.

The chloride of zinc when dissolved is termed "stock solution," and has to be diluted. This is done by computing how much of the stock solution will make a certain amount of water in the solution tub up to the required strength. When the diluted solution is being used a further test is required to get a more exact measurement of strength, resort being had to the Beaume hydrometer, which will measure to one-tenth degree. It is found that the diluted solution varies very materially with differences of temperature.

The glue and tannin solutions, used at one-half of one per cent strength, are so near that of water that it is impracticable to measure by the use of the hydrometer, but the same law governs. The amount of each of these is computed at one-half pound for each 99 1-2 pounds of water.

One pound of fair quality of commercial glue, large in gelatine (the sticking properties not being essential) will combine with one pound of hemlock extract usually containing 22 to 25 per cent tannic acid. If other and more concentrated form of the tannic acid is used they are proportioned accordingly.

The vacuum pump is used to exhaust the vapors and what little air remains in the retort after the steam has been discharged from it. While the pump is constructed to quickly do this, yet, owing to certain well-known laws of nature, a complete vacuum cannot be obtained. Practically it can be drawn to within about four inches (barometric) of the full atmosphere for the elevation. We will say for elevation at or near sea level, as at Chicago and at Somerville, Texas, about 600 feet above the sea:

	Theoretical.	Practical.
Barometric	30 inches	24 to 26 inches
At 3,500 feet elevation.....	26.62 inches	21 to 23 inches
At 7,000 feet elevation	23.38 inches	18 to 20 inches

What effect the less amount of vacuum may have on results has not so far been determined. It is deemed proper to call attention to the fact, however.

The effect of this treatment upon the timber by the absorption of the various solutions is summed up by the fact that the increased weight of the timber amounts to near 75 per cent. A tie weighing 100 pounds before treatment will come out weighing 175 pounds. It is observed, however, that a treated tie gives off its moisture much more rapidly than a fresh-cut tie will dry out. While the fresh-treated tie will be heavy to handle and to transport, yet it will often give off most of its moisture while awaiting the usual course of renewals.

LONG DISTANCE ELECTRICITY.

Among the features which were to have been especially elaborated in this report was the generation of electrical power and its transmission over long distances. In recent years this subject has become of recognized importance in the industrial world and Montana has a number of plants that singly or as a whole entitle their promoters to unsparing commendation. It is much to be regretted that owing to lack of opportunity through the press of other work the report upon this feature of Montana's industrial life could not have been conducted throughout to that high standard of efficiency and conclusion that was originally intended, but a personal investigation of the plants was found to be impossible. Therefore, the descriptions of most of the plants are far more limited than their importance justifies, but the data that is given was obtained from reliable sources and is entirely serviceable as far as it goes. For the facts and illustrations relating to the Missouri River Power Company the Bureau acknowledges its obligation to the Railroad Gazette and also to the management of the plant for its review and verification of the facts that appear in this connection.

THE MISSOURI RIVER POWER COMPANY.

Much interest is being manifested in engineering circles in regard to recent remarkable developments in electrical power transmissions over long distances and in the attendant use of higher and higher voltages. Although several plants have been proposed for the use of voltages higher than 40,000, the distinction of being the first to place in actual commercial service a large plant employing 50,000 volts transmission, belongs to the Missouri River Power Company. This installation was completed and the apparatus placed in operation about the first of March, and much credit is due to the general manager and engineer of the company, Mr. M. H. Gerry, Jr., who planned and executed the general undertakings.

It is to be noted that since the starting of the plant there has been no mishap of any kind to the line or apparatus. This, the writer believes, is somewhat exceptional in undertakings of this magnitude and character, since it is generally expected that at the start minor difficulties are liable to be met with, which, though possibly not serious, will nevertheless affect the continuous service of the plant.

The present power house of the Missouri River Power Company is located on the Missouri river, about 20 miles almost directly east of Helena. To those who are familiar with the early history of the Northwest, it will be recalled that, in the famous Lewis & Clarke expedition of 1803-4, up the Missouri river and across the continent to the Pacific, one of the resting places and points of interest spoken of is Black Rock Canon, met with soon after entering the Rockies at the mouth of the mountains, which is some miles to the east. Black Rock Canon is not now known by this name, but at

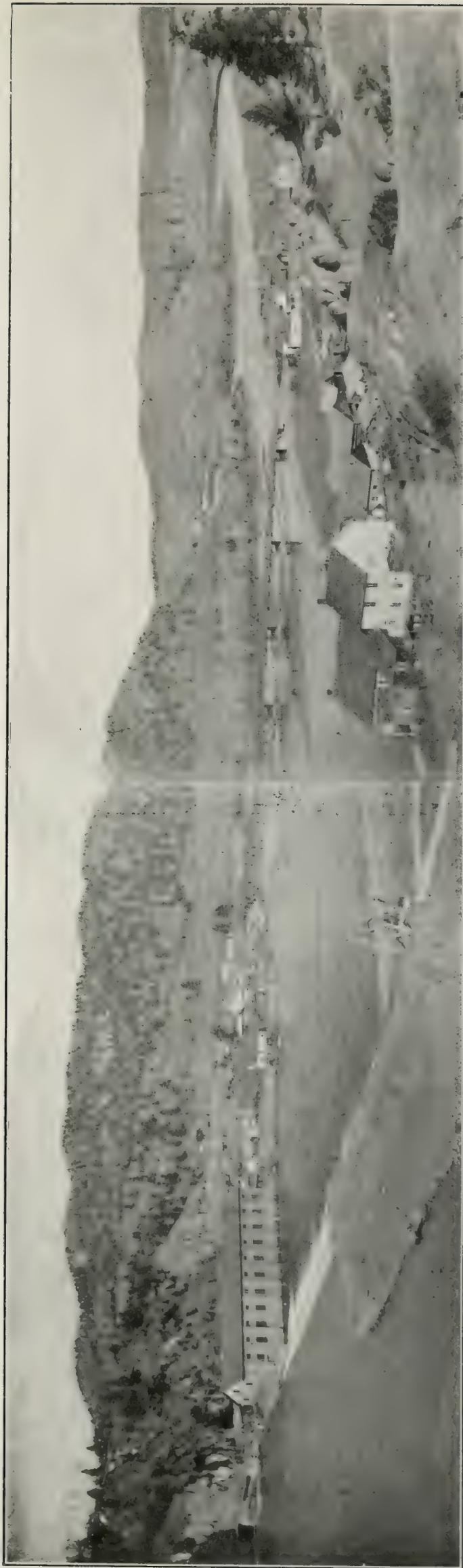
the mouth of the canon lies the present little town of Canon Ferry and the power house of the Missouri River Power Company. A general view of the power house and surroundings is given in the accompanying illustration, which shows it to be located in a country not as rough as some parts of the Rocky Mountain district but by no means level. The district immediately about Canon Ferry has been one of the famous gold-mining camps of the West, the discovery of gold having been made here in 1863. Placer mining is the more common way in which mining has been carried on, and it can be seen today, to a limited extent, within a mile or so of the power house.

At the mouth of the canon, a dam has been thrown across the river, about 480 feet in length and designed to give a 30-foot head of water supplemented by flash boards which are put on during the late summer and removed in early spring before high water. The location of the dam at Canon Ferry had enabled the company to take advantage of a low lying valley just above the entrance of the canon, in which to hold at all times a large volume of water in reserve. At the upper end of the canon the water spreads out over this valley, forming a lake about seven miles long by two to three miles wide. The canon by which the water comes to the power house is from 400 feet to 700 feet wide, and one-quarter of a mile long. The water in it does not freeze over in winter, and although the lake above freezes over, water flows to the power house as free from ice in winter as in summer. The amount of water in the river at this point is considered sufficient to develop 10,000 horse power the year around.

The project for a power plant at Canon Ferry was first started about 10 years ago. About four years ago, the decision to carry it out took definite shape, and work was started on a plant of 4,000 horse power. This plant consisted of four 750-kilowatt, 550-volt, 2-phase Westinghouse generators, driven by Dayton Globe Iron Works waterwheels, with two 90-kilowatt exciters driven by independent wheels. The current from these generators was raised by eight oil-cooled transformers from 550 volts to 10,000 volts, and sent to Helena and East Helena, 20 miles and 14 miles away, respectively. At Helena, the current was used, after transformation to 2,200 volts, for driving induction motors direct connected to arc-light machines supplying city lights, and for distribution for general incandescent lighting. Two rotary converters furnishing current to the street-car system of the city were also supplied. At East Helena, the current was used mostly for driving induction motors in the large smelter located there, and for general lighting about the works. One line from Canon Ferry also furnished power and lights to the Peck concentrator, between Helena and East Helena, until that mill was burned.

The line between Canon Ferry and Helena consists of but one pole line, carrying, however, four independent circuits—one to East Helena, one to the Peck concentrator, and two to Helena, one of the latter for lighting and the other for railway work.

In the fall of 1900, work was begun at Canon Ferry with a view of making a very considerable extension of the company's plant, the proposition being to enlarge the plant to a capacity of 10,000 horsepower by putting in



MISSOURI RIVER POWER COMPANY'S PLANT AT CANYON FERRY, LEWIS AND CLARKE COUNTY,

additional generators, with exciters, transformers, etc., and to extend the service to Butte, where it was expected that all the power the company might furnish could be sold. This expectation has been completely realized. To this end the company has installed six additional 750-kilowatt Westinghouse generators with the necessary transformers, exciters, etc. These generators are of the same size and voltage as the first four, but are 3-phase instead of 2-phase. The waterwheels are 45-inch horizontal, McCormick wheels, furnished by S. Morgan Smith, of York, Pa. All generators in the power house are direct connected to the wheels, flexible couplings being used throughout. With the new generators there were also installed a 225-kilowatt, 150-volt exciter, driven by a separate wheel, and a 115-kilowatt, 150-volt exciter, driven by an induction motor. To sum up, the power plant now consists of ten 750-kilowatt, direct-connected generators, with four exciters, of which two are 90-kilowatt machines direct connected to separate wheels, one a 225-kilowatt machine with a separate wheel, and one a 115-kilowatt, motor-driven generator. To make the plant uniform throughout, the four old generators have been overhauled and changed from 2-phase and 3-phase. Each waterwheel has its own governor, all the new and one of the old wheels having Lombard governors, and the remaining old wheels Replogle governors.

The switchboard gallery extends the whole length of the building, and, besides carrying the switchboard, carries also twelve 550-volt to 10,000-volt oil-cooled transformers for the Helena and East Helena service, as well as a plug board for connecting these circuits as needed under various conditions. The offices of the company will be located on the floor extending across the building at the end.

The main switchboard and exciter switchboard are both relatively simple boards in design, but massive and substantial in construction. The main board is 47 feet 4 inches long, and consists of 17 panels of blue Vermont marble two inches thick. The weight of the board complete is about 20 tons, the copper alone being one-half of this weight. The general arrangement is as follows:

The first five panels at each end are generator panels. The next two panels are feeder panels, and are intended for use with the 550-volt to 10,000-volt transformers. The eighth panel from the end on each side supplies a bank of transformers, 550 to 50,000 volts, for the Butte lines. The middle panel is a junction panel, so that any set of bus-bars on the two ends of the boards can be thrown together, there being three sets of bus-bars on each end of a board. The instruments mounted on the board consist of eight 750-volt alternating-current voltmeters, one for each set of buses and one at each end for the machines, independently of the buses; ten direct-current field ammeters; twenty-eight alternating-current ammeters; with sixteen indicating polyphase wattmeters, and six recording polyphase wattmeters. The recording wattmeters are behind the board. The exciter board consists of four panels of blue Vermont marble, similar to the main board, one for each exciter, with two sets of bus-bars. All field rheostats are mounted, under the

gallery floor, and are controlled by hand wheels, the shafts of which come up through pedestals in front of the boards.

The feature distinguishing the Missouri River Power Company's plant from all other transmission plants is the high voltage employed on its new lines to Butte. This is 50,000 volts, which is higher than is in use commercially on any other plant at the present time. The distance by pole line from Canon Ferry to the Butte substation is 65 miles, the route corresponding nearly with that taken by the Great Northern Railroad between East Helena and Butte. The line starts out at an altitude of about 4,000 feet above sea level at Canon Ferry and gradually rises until it reaches an altitude of 7,300 feet where it passes over the Great Divide a few miles east of Butte.

The line itself consists of two lines of poles about 50 feet apart, the cables being arranged in an equilateral triangle with a spacing of 78 inches between centers. Each line consists of three 7-strand copper cables, each cable having a cross-section of slightly over 106,000 C. M. These cables are transposed five times between Canon Ferry and Butte. The average distance apart of the poles is 110 feet. It has been found, after making exhaustive tests, that a thoroughly dry oak pin of the length used in this installation boiled in paraffin will readily hold up alone under 50,000 volts. Hence the object of the glass sleeve below the insulator is to keep as great a length as possible of the pin dry under all conditions of weather.

The transformers at each end of the line consist of six 950-kilowatt, oil-insulated transformers with water-cooling coils in the cases. Those at Canon Ferry transform from 550 to 50,000 volts, and at Butte the step-down transformer is made from 50,000 to 2,200 volts. The secondary circuits at Butte consist of 600,000 C. M. bare copper cable.

The customers of the Missouri River Power Company at present number nine, as follows:

At Helena and East Helena—Helena Power & Light Company, Helena & Livingston Smelting & Reduction Company, American Smelting & Refining Company, Big Indian Mining Company.

At Butte—Aaconda Copper Company, Butte & Boston Copper Company, Colorado Smelting & Mining Company, Boston & Montana Copper Mining Company, Washoe Copper Company.

The general offices of the company are at Helena, and the New York office is at No. 71 Broadway.

BIG HOLE POWER PLANT.

The power plant of the Big Hole Electric Power Company is located on the Big Hole river, three miles above divide, a station 27 miles from Butte on the Oregon Short Line Railway. The property consists of a dam 50 feet high and about 500 feet wide on the crest. The power created is generated by means of four 1,000-horse power Leffel turbine waterwheels direct connected to four 1,000-horse power General Electric alternating current generators. The current is generated at 800 volts and enters into step-up transformers with combination for 15,000 and 23,000 volts. This current is now being transmitted a distance of 21 miles across country to Butte at 15,000 volts. The step-down transformers change the current to 2,000 volts for

local secondary distribution. Construction work began in 1897 and was completed in 1900. It is a three-phase, 60-cycle, single pole line. It is estimated that the plant cost something like \$800,000. The power of the company is used entirely by the Butte Electric and Power Company, which is the local electric light company.

THE BIG FORK ELECTRIC POWER COMPANY.

The Big Fork river for several miles above the head gates is a wide, deep and slow running stream. At a point about 100 feet below or down the stream from the headgates the river becomes very rapid and so continues for a distance of about one mile and one-quarter to a point a short distance below the power house where it flows into the Flathead Lake. The river above the headgates being a quiet stream there is no dam required. It was therefore simply necessary to tap the river above the rapids which was done by means of an intake and headgates the bottom of which is six and one-half feet below the surface of the water in the river at low water. The intake is 21 feet wide on the inside and is built of heavy timber and planked. Below the headgates the flume narrows to 15 feet wide on the inside but continues the depth of six and one-half feet. This flume continues for a distance of 1850 feet below the headgates at which point the nature of the ground was such that a flume was not necessary and an earthen ditch was built being 10 feet wide on the bottom and the lower bank six and one-half feet high. This ditch extends for a distance of 1,900 feet to a point where the ground was of such a nature that an earthen ditch would not answer and a flume of the same size and kind as the first one was built for a distance of 550 feet where a ditch is again used for a distance of 300 feet and from this point is a flume 1,200 feet in length which extends to the receiving basin directly over the powerhouse.

From the receiving basin to the turbines the water is conducted by means of a steel penstock pipe 54 inches in diameter by 133 feet long on the center line, constructed throughout of soft tank steel 5-16 of an inch thick. The vertical distance from the surface of the water in the receiving basin to tail water is 109 feet.

Inside the power house the penstock is divided into two steel pipes of 36 inches diameter, which pipes are fitted with Ludlow pattern, 36-inch water valves. The water wheels consist of two of James Leffel & Company's latest improved 26-inch double-discharge horizontal turbines. Each turbine is supplied with one type "L" Lombard water wheel governor.

The turbines are direct connected to two Westinghouse, two-bearing, 180-kilowatt 514 revolutions per minute, 440 volts, two-phase, 7,200 alternations generators. The generators are excited by two multipolar direct-current exciters, belted from the main turbine shaft. The switchboard in the power-house consists of two Westinghouse type 6-generator panels of 600 amperes capacity each. The electric motive force is raised at the powerhouse by two oil cooled transformers of 200 kilowatt capacity each from 440 volts, two-phase to 12,000 volts three-phase. The electrical machinery in the power-house is well protected from lightning by lightning arresters.

The 20 miles of transmission line from the powerhouse to Kalispell con-

sists of three No. 6 soft drawn copper wires put up on porcelain insulators which are guaranteed to stand a voltage of 40,000 volts, one wire being on top of the pole and the other two on a four-foot cross arm which is 33 inches from the top of the pole making the three wires an equilateral triangle. The poles are 132 feet apart, 28 feet long and not less than seven inches in diameter at the top and are put five feet in the ground. On the same poles the Company also has a metallic circuit telephone line to the powerhouse from their office and substation in Kalispell. The substation in Kalispell is supplied with lightning arresters, high potential circuits breakers, transformers and switchboards. The transformers consists of two oil-cooled step-down transformers from 10,800 volts three-phase to 2,200 volts two-phase. Both at the powerhouse and at the substation there is an extra transformer.

The company has contracted for additional machinery to be put in place in the spring which will more than double the present capacity of the plant, making the capacity about 1,350 horse power. With the new machinery the plant will have cost \$150,000.

The power is sold in Kalispell for lighting and power purposes and the demand for power has made it necessary to add the new machinery for which the company has contracted.

MADISON RIVER POWER COMPANY.

The Madison River Power Company began construction of its plant during the year 1898 and completed it during February, 1902. The plant is located in the Madison River Canon, near Red Bluff, 65 miles from Butte to which latter place the current is brought for commercial use. A double pole line has been built and of the most substantial character possible. This is the only aluminum wire line in the State, and is designed to carry 40,000 to 80,000 volts, 40,000 being the actual pressure for present purposes. The plant cost approximately \$500,000.



AN INDIAN GRAVE

PLASTER PARIS AND STUCCO.

The gypsum fields of the Montana Plaster Paris Company were discovered in 1893 and active development began in January, 1894. The deposit is of Cretaceous geological age and is from two to ten feet thick, averaging about six feet, and lies almost flat about 30 feet under the surface of the ground. The first layer at the surface is soil; then come shale, limestone, red shale, blue shale and the gypsum. The actual operations of this property have been of a desultory character until within the past two years on account of lack of knowledge as to the method of treating the product in order to make it perfectly adapted to commercial use. The expense of stucco is approximately one-fourth greater than the old-fashioned lime plaster and to bring it to that stage of excellence that would commend it to the consumer at the advanced price has required some years of study, experiment and hard work. Another obstacle has been that of transportation facilities, the property, being eight miles distant from Bridger, the nearest railroad station, which is 29 miles from Billings on the main line of the Northern Pacific Railway. However, through the great persistence and ability of the manager of the company, Mr. H. J. Smith, perfection has been attained and, notwithstanding the long wagon-haul, the commodity is being turned out in car-load lots regularly as fast as it can be manufactured and transported to the railroad, and where it has once gone it is in demand, it having already despatched some of the eastern competition in the State.

The Aluminum Plaster Company of Armington, is now the only other plaster paris and stucco plant in Montana, the ones at Kibbey, in Cascade county, and Libby, in Flathead county, having been destroyed by fire. This company is managed by its president, Mr. A. J. Voight, who formerly manager of the Kibbey plant. The quarry was opened during the year 1900, the gypsum ledge lying flat under several feet of limestone and is about 16 feet thick. This is probably of Cretaceous age, the same as that in Carbon county, as also are those deposits in Iowa which have contributed so much wealth to that state, employed large numbers of men and altogether has developed an industry that has had the world for a market until the date of the perfection of the Montana products since which time that from Iowa and South Dakota only finds customers in the West where the capacity of the two concerns under consideration fails to meet the demand.

The mill of this plant is located directly on the Neihart branch of the Montana Central Railway six miles above Armington on Belt creek and 34 miles from Great Falls. The mine is directly back of it and sufficiently high on the hillside so that gravity is largely helpful in handling the rock. Up to the present time wagons have been utilized in transporting the material from the quarry to the mill, but this method will shortly be superceded by a tram car system which will admit of the loaded cars traveling to the mill by grav-

ity and hauled back empty by horses. The system here is to feed the rock through a 12x14-inch Blake crusher, directly from the rock bin, which crushes it to about one inch; then through a Gates crusher, which reduces it to one-quarter of an inch; then it is elevated to a trommel which separates the coarse from the fine, all over 40-mesh going down through a gravity pipe into a French burr which reduces everything to 40-mesh or finer; from the burr it is again elevated to the same separator whence it travels by gravity to a bin over the calciner. The calciner holds about three tons and in this mechanism the gypsum is dehydrated by subjecting it to heat at 260 degrees Fahrenheit for two and one-half hours usually. From here the plaster paris is conducted to a storage bin where chemicals and fibre are added, then through a Broughton mixer which finishes the stucco process.* The capacity of the mill is 30 tons per day of 24 hours which it regularly turns out and loads directly in the railroad cars for shipment. More than one-half goes to Seattle and Spokane, the balance being marketed at Great Falls, Butte, Missoula and Helena.

Gypsum deposits are a valuable asset to the industrial welfare of a state, and especially so where the original deposit will run 80 and 90 per cent in purity as do these two quarries. Contractors of wide experience in the use of plaster paris and stucco in the United States and foreign countries have pronounced the product of these mills equal to any they have ever attempted to use and better than the most. As an industry it cannot be said to have more than barely started in Montana, but its future is undoubtedly of commercial importance as plaster paris and its compounds are coming into greater popularity in the building trades and for fertilizing purposes each year. While there are practically no fertilizers used in Montana, and the people do not feel their need, yet, it would seem that where the soil is made up of a sandy loam, crushed gypsum might be so used with profit; in fact, the Experiment Station at Bozeman has made several tests and reported that it increased the production 25 per cent. While these usually consume the greatest bulk, there is a considerable list of uses in which it figures in a more limited way as, for instance, alabaster or satin spar for ornaments; as an absorbent of organic material in fertilizers; as an adulterant of foods and medicinal preparation preparations under the name of "terra alba;" in the manufacture of glass and porcelain; moulds for coin, statuary and pottery; in wines to retard fermentation, etc., etc.

Workmen, inexperienced in the use of stucco and gypsum cements, are apt to make a failure for one reason or another as it requires quite different handling than the old lime-mortar plaster. And, again, it was only by tedious and costly experiment that these firms were enabled to develop their product to the point where they could say to the purchaser, "This will 'set'" in a certain number of minutes. In its present stage of perfection it can be specially manufactured to order and made to "set" quickly, or, by the use of retarder, in a longer time. It is a non-conductor of heat and, therefore, cool in the summer time; it is extremely hard, and so close grained as to be susceptible of an almost marble polish and, therefore, warm in the winter; it can be mixed with coloring matter to produce almost any tint. Changes

of temperature do not effect the walls and there is no chipping or cracking. Contractors and workmen who thoroughly understand the nature of gypsum products can obtain perfect results and, to assist those who are about to employ its use the following directions are given by the Montana Plaster Paris Company:

DIRECTIONS FOR USE.

For Plastering.

The most convenient size mortar box is five feet long by two and one-half feet wide.

In lathing, 3-penny common nails should be used and a small space left between the ends of the lath to prevent buckling.

The following proportions are made for two plasters working together:

For the first and second coats, take 50 pounds (two common pailfuls) of stucco and mix thoroughly with four pailfuls of clean, coarse, dry sand. Mix thoroughly. Spread the mortar over eight or ten yards first coat, then follow up with the second coat as soon as the first coat begins to set. Sprinkle on a little water with a brush when using the darby, if necessary. Leave brown wall straight but a little rough under the darby, as the putty coat gets a firmer hold on a rough surface than one smooth or floated. Use no float on this work. This mortar should not be worked after it begins to set, as when the set is once thoroughly broken, the wall is worthless. No wall should be soft longer than 30 minutes after mortar is mixed. If such is the case the stucco has been killed by working after it has begun to set. In all the joining make the outer edge taper so the next guaging will go on without a break in the even thickness of the wall. For one plasterer working with one helper, mix one-half of the quantity. If the mortar sets too quick for a beginner, mix small batches. It will be found more convenient to have stucco, sand and mortar box in same room with plasterers, thus making it as easy to put on a wall with the material in winter as any other time.

For third or putty coat, make mortar and do the same as on lime wall. Let the brown mortar get thoroughly dry before putting on the putty coat, and then wet the wall as little as possible. Our best workmen do not wet the walls at all. Chip cracks are caused by using too much lime, or by not mixing the stucco and lime thoroughly, or by putting the mortar on after the stucco has begun to set.

Frost will not injure stucco plastering unless it is subjected to an unreasonable amount of continuous freezing and thawing while the walls are very wet.

Before the second or third coat is put on a frozen wall all frost and ice should be melted off the face of the same to enable the two coats to cement together.

We do not recommend this new method of plastering to poor mechanics. A man who cannot make a good lime wall will fail with stucco. All the failures that have attended this work so far have been made by novices, while on the other hand, every good plasterer that has taken hold of it has been successful.

Do not re-mix plaster. From the time the sand and stucco are put together, there should be no delay until the same is on the wall. Be sure to clean tools and mortar box thoroughly after putting on each guaging. This is very essential. Many plasterers injure their walls by leaving a little mortar in the mortar box on the mortar board and tools, and mixing the same with the next guaging.

Always paint outside walls of stucco. Red roof paint, pointed in white to brick size makes a handsome finish.

When using retarded stucco it is not necessary to use glue water.

For Filling Crevices in Log Houses.

Mix for first and second coats of plastering. It is possible, however, to dispense with glue water by mixing only very small quantities at once and putting in quickly.

For Brick and Stone Work.

Mix five pails of sand to 50 pounds of stucco, with one pint of glue water.

General Directions.

For estimating quantities, allow for plastering, eight pounds of stucco to one yard of two-coat work. For filling crevices in logs, one pound of stucco to about two feet of chink. Never mix stucco with sand and allow to stand before using. This is very important, as the dampness of the sand weakens the set of the stucco. Sand should be coarse, sharp and dry. Less proportion of sand must be used if inferior. Should your walls dry before setting, spray them with clear water and they will set as hard as stone.



MONTANANS ON A SUMMER VACATION

GRINDSTONES.

The item of 150 tons of grindstones produced in Montana during the year 1901, as shown in the table of stone production, to most people whose chief knowledge of the use of grindstones is that of their metaphorical utility for grinding noses, will be passed, no doubt, as merely an uninteresting item in the grind of the State's statistical mill; but to those who have use for the tool in an extensive and expert way the announcement will attract attention. And to those familiar with the quarrying, manufacture and sale of the article it will bear a significance. It is a commercial challenge from Montana to seven states in the Union whose total product in 1900 amounted to \$761,241, of which Ohio produced considerably more than one-half. It serves notice upon the grindstone trust that it will soon have to deal with a formidable competitor for, according to data at hand there is no such quality of grindstone on the market to-day from any other quarry in the country and it equals those of foreign countries which are used in the most delicate operations of opticians in the manufacture of eye glasses. An instance in point attesting the truth of this statement is that of a manufacturing optician who made a small grindstone from a piece of stone taken from a car shipped to the Northern Pacific Railway Company, and which he claims to have demonstrated to be equal to stones used by opticians generally for the grinding of lenses and which are produced only in Wales. Such a stone sells readily on the market in this country at \$4 per pound. This expert states that the fine, even-grained sandstone from the quarry of the Montana Sandstone Company at Columbus, does the identical work that he has formerly employed the Welch stone to do.

The needs of the quarry company itself are of a stenuous character as relates to its tool grinding implements on account of the large amount of dressed product it is continually turning out for building purposes to plane which requires a perfectly edged tool. It was because of dissatisfaction with the work of eastern grindstones that the superintendent of the quarry determined to experiment with the material at hand for edging his tools. As a result of these experiments the eastern stones that had caused so much trouble by reason of the hard and soft spots in them which caused the grindstone to get "out of true," were finally superseded by the home product. In the course of four years of practical use it has been demonstrated that the Montana product is immensely superior to anything theretofore purchasable on the market in points of evenness of texture, durability and the saving of time in the grinding of tools. The evenness of texture of this stone is at once noticeable to any experienced observer. It has been proven that the life of a 60-inch stone from the Berea or Cleveland quarries in Ohio was only approximately 30 days while the same sized stone from the company's quarry lasted as long as eight months and would grind tools in from one-quarter to one-half the time required by the eastern product.

Also, a substantial witness to the superior quality of the Montana grind-

stone is the superintendent of the foundry department of the Anaconda Copper Mining Company, who has used the Columbus quarry article for three years and claims it is worth ten times as much as that on sale from any of the eastern quarries; that he would rather pay 25 cents per pound for the home product than two and one-half cents for the eastern.

On May 23, 1902, Messrs. Riehle Brothers Testing Machine Company, of Philadelphia, reported the following tests of three-inch cube samples taken from the grindstone strata of the Columbus quarry:

"Subjected to the frost test the specimen was frozen 12 hours at 6 degrees Fahrenheit above zero, then placed in water at 70 degrees, raised to 212 degrees and maintained for five hours. The specimen showed no evil effects from the test.

"Subjected to compression the specimen spawled at 57,000 pounds pressure and broke at 76,000 pounds.

"Subjected to the absorption test, the weight of the specimen after drying five hours at 212 degrees Fahrenheit, was 1194.5 grams. Weight of specimen after boiling five hours at 212 degrees Fahrenheit was 1243 grams. Increased weight due to absorption, 48.5 grams, equal to 3.9 per cent absorption.

"Subjected to specific gravity test, the weight of the specimen in air after drying five hours at 212 degrees Fahrenheit was 1217.5 grams. Weight of specimen in water, 701.9 grams. Specific gravity, 2.34.

"Specimen subjected to abrasion test was dried five hours at 212 degrees Fahrenheit after which it weighed 1217.5 grams. The weight of this specimen after abrasion at 30 pounds mean pressure was 1022.6 grams, equal to 16 per cent loss."

One of the chief points in a grindstone is its tensile strength and while this point has not been specifically tested, it will readily be inferred from the foregoing that the subject of this report is of superior quality in this respect.

The quarries of the Montana Sandstone Company were located in the fall of 1898. The quarry was located originally for its value as building stone but as development proceeded four different grades of stone adaptable to the manufacture of grindstones were encountered, running from a very fine grain to very coarse. The market for the grindstone product has thus far been confined to Helena, Spokane, Anaconda, Butte, Bozeman and Billings, but it is proposed to enlarge the plant at an early time with a view to pushing this particular part of the product commercially into the eastern market where it will undoubtedly find ready sale to large manufacturing establishments where quantities of edged tools are used.

GRAPHITE.

Another very important industry is promised from Beaverhead county in the production of graphite. This mineral has a metallic luster, its color ranging from iron-black to dark steel-gray, and can be easily recognized by a greasy feeling. The finer qualities are used in the manufacture of lead pencils, and the coarser in making crucibles, lubricants, stoveblackening, etc. Ticonderoga, N. Y., furnishes all the graphite used for pencils at present, but it is considered certain that the vein of this mineral now being developed in Beaverhead county is of even better quality than the New York material. Over 14 years ago a deposit of graphite was discovered in Van Camp's canyon, 18 miles from Dillon, but it was not until the summer of 1901 that a company was formed to systematically develop the property. This corporation, known as the Crystal Graphite Company, put a number of men at work upon the group of claims, which consists of the Last Chance, Homestake, Bird's Nest, Mayflower, Eureka, Faithful, Ground Hog and Lucky Boy. The principal work was done on the Bird's Nest claim, where a tunnel 55 feet in length was run. The vein is a true fissure, and varies in width from 12 inches to a few feet. It is said to exist in favorable geological formation, and that it is continuous throughout the entire length of the eight claims. The graphite is found in a nearly pure state, sometimes blocks weighing more than 10 pounds being taken out, and even in the low grades where the crystals are mixed with brecciated country rock in the vein the graphite is nearly pure. Many test shipments, varying from 1,000 to 2,000 pounds have been made. The Dixon Crucible Company of Newark, New Jersey, reported that the Montana graphite was equal to the best grades imported from Ceylon, where the bulk of the graphite used in the United States is mined. This quality of graphite is worth from 4 to 10 cents a pound. Aside from lead pencils, the most common use of graphite is in making crucibles which are used in converting iron into steel. The graphite is mixed with fire clay, the crucibles are formed, and these, filled with crude iron, are placed in a furnace where the carbon of the graphite is absorbed into the iron through the agency of intense heat, and a steel ingot is the result.

The presence of both graphite and fire clay in great abundance, and of the very best quality, together with the recent activity in Montana iron properties, leads to the conclusion that the near future will witness a combination of these interests and that a great iron and steel plant will soon be added to the industries of the State, with all the benefits in other lines that its establishment will encourage or make necessary.

MANUFACTURE OF MACARONI.

On the 6th of April, 1901, a company with a capital of \$35,000 was formed in Butte for the purpose of manufacturing paste products, macaroni, vermicelli and the like. A building was erected and machinery was installed, the presses being equal in capacity to those of the largest factory in the United States.

The company is the outgrowth of a small business which was first established in Great Falls by the present manager, Mr. Savin Lisa, in 1898. Sixteen people, 12 of whom are highly skilled in the processes of manufacture of these paste goods, are employed, and the mechanical apparatus consists of one kneader, one mixer and three presses, with a capacity of more than 2,500 pounds of finished product a day. One of the presses will turn out 140 pounds of macaroni in 40 minutes. The power is furnished by a dynamo in the building, running a five-horse power motor. There is also a boiler and engine which furnishes power when required. The dry room has a space of 2,750 square feet, and the packing boxes are also made on the premises.

The flour used is from the finest quality of hard wheat, which for this purpose is especially prepared, being rolled and bruised barely enough to loosen the hull. The paste, after going through the mixer and kneader, is forced through the presses under heavy pressure, the bottoms of these being fitted with devices which allow the paste to emerge in the proper forms. After proper drying the product is packed for market.

So remarkable has been the success of this business that the capital stock of the company has been increased to \$50,000. In this connection the following information regarding "Macaroni wheat" will be of interest to Montana grain growers:

According to M. A. Carleton, cerealist of the Department of Agriculture, there is a great opportunity for Montana farmers in the arid belt in the raising of macaroni wheat. The subject is treated in a monograph recently published by the Bureau of Plant Industry and it is of timely interest to Montana, as it developed a plan whereby large sections of arid bench lands and vast stretches of unirrigated prairie may be transformed into valuable farming lands. In the map which accompanies the monograph, large sections of the State are indicated as suited to the cultivation of macaroni wheat. The portions indicated include nearly all of the western valleys—the Bitter Root, Missoula and the northwestern section and large tracts on the eastern side of the divide, particularly the Gallatin and Yellowstone valleys and vicinity. The ideal section of the United States for the culture of this drought-resistant wheat is a belt extending from Canada to the gulf through the Dakotas and Texas, but very favorable conditions for the growth of the wheat exist in Montana, where the soil is rich in nitrogen.

For many years the Department of Agriculture has been experimenting

with hard wheats in the effort to discover a drought-resistant variety suitable for profitable culture in the semi-arid regions of the United States. The experiments have included many varieties, with the result that in the Russian macaroni or durum wheat of the famous Black Earth district has been found a wheat that answers all of the requirements of the situation in the United States. The macaroni wheats are extremely resistant to drought and also the attacks of most fungous pests. They are adapted to soils rich in nitrogenous matter, and invariably give the best results in a hot, dry climate, maturing in a shorter time than other wheats with a considerably largely yield to the acre.

The lack of a market has been an obstacle to the cultivation of macaroni wheat in this country, but now, according to statements made by the Department, there is a rapidly growing demand for the variety, both in this country and in France and Italy. Russia cannot supply the demand, nor can she lay the wheat down at Italian or French ports any cheaper than can the United States. In addition to this there is an increasing demand for macaroni for bread making as it is far more nutritious than the common varieties now used.



HOMeward BOUND—FLATHEAD COUNTY

GARMENT FACTORY.

One of the promising new industries established in the State during the past two years is the overall and garment factory operated in Helena by the Benn Greenhood Company. This is the only concern of its kind in the whole Northwest. Starting on August 28, 1901, with 20 machines this firm is now operating a total of 71 machines with a daily capacity of 104 dozen garments of all kinds. The operators, mostly female, are all members of the Garment Makers' Union and the product bears the label of the American Labor Union. The sanitary conditions of the factory are admirable, closets, cloak and lunch rooms being provided, with plenty of light and air in the work rooms. The machines are run with electricity and a full line of manufactured goods is made including overalls, shirts, pants, jackets, corduroy and mackinaw suits. The operators have nearly all been brought from the East at the expense of the proprietors and are thoroughly experienced. In this department alone the company has an investment of \$35,000 and a weekly pay-roll of about \$1,000. Especial attention has been paid to the comfort of the employees and everything in the way of privacy, safety and sanitation has been supplied. The product has met with ready sale although no effort has been made to compete with the low-priced sweat-shop goods turned out by eastern and western competitors. The vast consumption of this line of goods by the working-men of the Northwest should be entirely supplied by this or similar factories. It requires a high degree of courage to become a pioneer in such a business and a generous support from both the business men and working men should be cheerfully accorded to its promoters. Having the plant once established its size and the number of people employed are only limited by the demand for the goods and a success in one line of manufacture is sure to lead to others.

FENCE FACTORY.

In July, 1902, the Montana Anchor Fence Company purchased the rights for Montana to manufacture a stay and clamp for wire fence, and the factory was located in Helena. The company does not manufacture wire, but has several ingenious machines operated by electricity for the manufacture of the patent devices under its control. Its product fully complies with the Montana law in regard to legal fences, is stable, durable and cheap, the material for a mile of good three-wire sheep fence costing only \$55. The clamps are made from band steel fed to a machine from a roll having a capacity of 90 clamps a minute. There is also a machine for making the stays from a low carbon wire which is a splendid piece of mechanism.

The company is incorporated for \$25,000, but will shortly increase this amount to \$35,000, and expects to do a business of \$100,000 next year. The fence is easily put up and very cheap and durable. Ornamental fences of all

kinds are made as well and tree guards. This home enterprise was encouraged by the Capitol Commission to the extent of an order for a fine sample of its work which encloses the capitol grounds.

Among the other decided advantages of this fence is a ratchet device by which the slack in the wires from any cause may be taken up at any time as occasion may arise. This is an exclusively Montana enterprise, a pioneer in its field, and with the encouragement of home consumption, promises to develop into a large employer of labor requiring in time an enormous capital in its operations. The directors and stockholders are all local men and the profits arising from the operation of the plant as well as the wages will, of course, remain at home.

MONTANA MARBLE.

The figures on stone production show that during the past year 450 tons of marble were taken from the various quarries in the State. That this production is about to be enormously increased, and that Montana will soon take an important place in both quantity and quality of marble produced, is unquestionable. About five miles southwest of the city of Helena a vast ledge of marble, containing several grades and qualities of this valuable commodity, has been located, and a company consisting for the most part of Spokane capitalists has been formed for the purpose of placing the product of the quarry upon the market. Enough work has already been done in stripping the ledge and in working up and polishing the various kinds of marble to prove that this is not alone one of the most valuable quarries in the world but one of the largest as well. While it is very unusual that more than two grades of marble are found in the same deposit, this one shows not less than seven distinct varieties, consisting of three different grades of Creoles, Sianias and Egyptian blacks and creams, a vast body of white statuary marble of great value, another of Carrara marble, used for statuary and monumental purposes, and also very valuable and great quantities of blue marble used for building. There is also a large deposit of Georgia white marble, principally used for decorative purposes. This stone runs in value from \$5 to \$25 per cubic foot, and there is an almost unlimited demand in the market for marble such as this quarry will produce. As to the amount contained in the 20 claims owned by the company, it is impossible to estimate. It is known that there is a solid deposit 1,320 feet in length, and the promoters are confident that they will be able to work nearly the whole of the 465 acres embraced in the claims. In the matter of transportation the company is particularly fortunate as the deposit is only about two miles distant from the Rimini branch of the Northern Pacific Railway and a spur of this length will give a direct outlet to all the markets of the West. Taken all together, the outlook for an enormous industry in this line is very favorable. The opening and working of the quarry will necessitate the employment of a large number of men and the distribution of many thousands of dollars in wages. The company is actively engaged in preliminary work necessary to the development of its valuable property and confidently expect to have their marble on the market during the year 1903.

MISCELLANEOUS.

MUNICIPAL OWNERSHIP.

A Detailed Report of the Results of an Investigation Into Each of the Municipal-Owned Water and Light Plants in Montana, Made by the Chief Clerk of the Bureau.

It has been the purpose of this investigation to determine as to the advantages or disadvantages, the merits or demerits of municipal ownership of water and light plants of the various cities of the State where both private and public ownership and management have been tried. Incidentally mention is made of those plants that have been constructed by the cities themselves and their status taken into consideration as far as practicable. The question that has been kept constantly in mind is: "Have the people of this community gained or saved anything to themselves by the acquisition and operation of this plant as compared with the amount of their rentals paid the former private corporation for like or similar service?" Whether a plant has been conducted as cheaply as a private corporation could do has been a secondary consideration. The net results to the people is the standard by which municipal ownership should be judged. Whether a plant has been a profitable business enterprise, as such, is not so consequential.

If the records and data have indicated that the people of a community have money in their pockets as a result of owning and operating their water and light facilities over and above what they would have had in the event of a continuance of private ownership and management, it would seem that judgment in favor of municipal ownership is definitely indicated. No preconceived ideas were allowed to influence the Bureau's agent in this undertaking. In each case the history and data are recorded as faithfully as diligent inquiry and the records would permit.

To this end the minutes of council proceedings were searched paragraph by paragraph for years back, ordinances and resolutions were noted, the accounts of the water departments carefully figured over for statistical data, and a limited canvass made among those with whom the Bureau's agent came in contact for the purpose of gathering facts pertinent to the opposite conditions of ownership and arriving at the sentiment as to the former and later organizations that had supplied their needs in the matter of water and light.

Bozeman, Miles City, Great Falls and Fort Benton are the particular cities from which the best comparisons can be had. At this writing Philipsburg is in a stage of negotiation, but perhaps may not come into actual possession of the private plant which the city is proposing to buy until too late

to appear in this report. Red Lodge and White Sulphur Springs constructed and are operating plants that are upon a paying basis. The Lewistown works are in process of construction. Chinook was not personally visited, but from reliable authority it has been learned that the town has voted to issue bonds for a municipal water plant, the source of supply to be the Milk river.

Municipal ownership has been comparatively slow of development in Montana. Fort Benton was the first city to embark nine years ago and since that time an average of one each year has been added to the municipal roll, though all the others have come under the proprietorship of the people since the spring of 1896.

It will be noticed that there was a great amount of agitation, opposition and negotiation in each of the cities where works had been inaugurated by private corporations before these cities could gain control. The agitation for municipal ownership arose from various causes such as dissatisfaction with the water supply or the rentals exacted by the private company, and more or less from the logical fact, as the investigation has proven, that there is no necessity of employing private enterprise to perform a service which can be quite as satisfactorily rendered by the community, and for the community, at first cost, thereby saving the profits that otherwise accrue to stockholders who may or may not have another interest in the city beyond that of collecting dividends upon the franchise privileges the residents have voted them. Usually the stockholders of the private companies have been residents of other states.

The opposition to municipal ownership was found to be of various kinds and based upon many grounds, but that most persistent seems to have been the business interests of the private company itself which usually found a liberal quota of friends to assist it in its cause. The character of the negotiations, of course, depended upon these factors.

However, after due consideration is given all the facts brought out under this investigation, one is forced to the side of both the theory and practice of municipal ownership and operation. If, for instance, an individual, as manager of a private corporation, can conduct a water plant satisfactorily to his directors and stockholders living in eastern cities, there can be no worthy reason why he cannot render as efficient service to a public corporation comprising as directors and stockholders the people of the community in which he is living and operating. It would be as reasonable to assert that if the people of a given city should acquire the water works that gravity would reverse, the reservoir turn upside down, the steam in the boilers become inert, the pumps slothful and the source of supply tricky and dishonest as to set up the theory and argument that a man cannot be as diligent and honest in a public as in a private capacity.

This view is further corroborated in the light of the vast number of receiverships which have gone through the courts of the country in the last eight or ten years of which it is said that 40 per cent of the railroads were placed in the hands of the courts, the same officials conducting the details of their various positions as while in private hands, and after the stress had been relieved the properties were returned to their owners, the same officials still

continuing their duties as formerly. It has never been so much as suspected that these officials were not equally painstaking and conscientious in the discharge of their duties whether in a public or private capacity. Except for the legal processes notifying them of the change they would not have known whether they were working for a private corporation or for the whole people through their public representative, the court, who was in direct charge of all the affairs of these vast public utilities.

A case directly in point in this connection is the receivership of the Butte Water Works Company which was granted by the United States Court. The private corporation manager was made receiver and continued to perform every duty assigned him by the government—the people's court—as faithfully as if he were receiving instructions from the board of directors of his corporation as formerly. As an honorable man he would be just as faithful and equally competent as manager of the water works for the people of Butte.

Again, it is a fact that the present officer who makes the collections of rentals at Great Falls, and conducts all the affairs of the water office, including the accounts, is the same person who did this work for the private company, and it is not overstating the truth to say that the business of his department could scarcely be improved upon either in point of method or his painstaking disposition in the discharge of his duties. His accounts are sufficiently elaborate and adequate for the most exacting demands of an extensive business and all duties are promptly dispatched.

The great scare-crow of "politics" that is invariably urged by the opponents of public ownership, barely showed its head once in the course of this inquiry and this was in the shape of a reduction in rates which the people received the benefit of, as a matter of course, and at the next election the political party making what was intended to be a concession lost ground in the council.

Unquestionably the most rigid civil service laws should accompany the taking over of any municipal enterprise. It should be as far removed from any political influence as possible. But even if this safeguard is not provided, it is demonstrated in Montana that the people are better off, regardless of the evils of politics, or any other evils that can befall an enterprise, by owning and operating their quasi public utilities. In any event, there can scarcely be greater political influence and interference in the economic affairs of cities and states than is wielded by the private corporations of every character at the present time and in the past. Railroad officials have testified under oath to their own attempts at influencing elections and legislation, and a rather noteworthy incident in point will be observed to have occurred in the course of the negotiations for the plant at Great Falls in the shape of a telegram from Mr. Samuel Hill, of St. Paul, president of the Montana Central railway, who sought to discourage the city council in its attempt to purchase the then existing plant, or build a new one.

Miles City undertook the redemption of a private failure and so far as her citizens are concerned the attempt has proven a success, although at the prevailing rates for water and light there is some question whether, if taxes

were paid, as in the case of a private corporation, it would be a profitable business; yet this city has rescued the plant from decay, has improved it, is meeting the interest on the bonds promptly, is furnishing as good a lighting service as there is in Montana and when present plans are completed for an adequate water supply there will be no further trouble on this score. Ft. Benton is similarly statused.

Not many years ago municipal ownership in Montana was regarded as a fantasy; gradually during the past ten years it has grown, in spite of ridicule and epithet, to the dignity of an idea; today this idea lives in all the adornment of popular approval—a realization; a fact. And in the course of the interviews that the Bureau's agent has had with a great many people in the various towns where municipal ownership is in vogue, it must be said that not a single person expressed himself as willing to allow the water or light plant to go back into the hands of a private corporation. This feature of the investigation only impressively demonstrates the struggle that every new idea has had for existence, and this is particularly true of economic reforms. When, for instance, it was proposed to make ten hours a legal day's work, it was predicted that it would bankrupt all the great industries of the country. When it was realized, the industries adjusted themselves to it and nobody thinks of returning to a working day of greater length. There was a long struggle for an eight-hour day among certain vocations in Montana. This idea did not commend itself to a great many, but it became a fact and its blessings are undoubtedly greater than any evils that may be charged against it. When the Australian ballot was proposed it was freely declared that it would be the means of destroying the franchise of the people, but it did not, and today it is very generally surmised that this piece of civic mechanism may yet become an important instrument in the preservation of liberty. Municipal ownership was judged impracticable, extravagant and a waste, at first, but to-day, more than one-half the water plants in the United States are owned and operated by the people and it is not uncommon to find kindly expressions in its favor in the daily press and, more than all, as above mentioned, there is not a single man living under municipal ownership in Montana, so far as the interviews of the Bureau's agent extended, but who pronounces it the scientific, the sensible, the just, the practicable, the right thing to do.

That water and light plants, being subjects for monopoly, should be owned by the people, has been clearly demonstrated as a scientific maxim by this investigation.

BOZEMAN WATER WORKS.

At a special election held October 4, 1898, the taxpayers of Bozeman authorized the issuance of bonds to the amount of \$165,000, \$155,500 of which amount was to be paid for the purchase of the water system then owned by the Bozeman Water Company, a private corporation, and \$9,500 was pledged to the improvement and extension of the water supply. These bonds were to bear interest at the rate of 5 per cent per annum, interest payable semi-annually, and the bonds were to be redeemable in ten and due in twenty years. On the 7th of February, 1899, the deal was consummated by Mason, Lewis &

Co., of Chicago, taking the full amount of the bonds, which firm in turn sold to Mr. Nelson Story, of Bozeman, \$40,000 of the issue. The money received upon the bonds was paid to the Illinois Trust and Savings Bank, of Chicago, as agents of the Bozeman Water Company. The trust company thereupon released a mortgage for \$104,000 which it had been carrying against the old water company and executed a deed for the plant to the city of Bozeman.

The events which led up to this step in municipal ownership in Bozeman seem to have had a rather peculiar aspect. It is said that there had been considerable agitation, so much so as to be annoying to the private corporation, and it is also said that the business men were extremely reticent to make expression either for or against during the time of the agitation. The election returns showed only 152 votes cast, 90 in favor of municipal ownership and 62 against. The best estimate that can be procured as to the number of taxpayers entitled to vote upon the proposition at that time is from 450 to 500, after excluding the non-resident and women taxpayers. This is at least suggestive of a very slight interest in the project and, under the circumstances, one can scarcely restrain his amazement at such a revolutionary movement marching directly to success.

It is true that some of those interested in the private corporation obtained an injunction restraining the old company from making the sale to the city, but the effect of this was only to delay proceedings. However, it seems plain that even the opposition from this source must have relented, for it is reasonable to believe that the company could have mustered a vote equal to the total number cast if it had been disposed to have made an earnest contest. Neither does there appear to have been any accusations against the old company beyond the one of high rates for water. The explanation that is offered for the origin of the undertaking is chiefly the incentive for cheaper water and, in a more general way, that the idea of municipal ownership is stubbornly making inroads upon the old private corporation theory. This idea has only taken root in recent years and, therefore, the reticence of some and the disinterestedness of others when brought face to face with an opportunity to choose. Another feature, further accounting for the hesitancy of the voters, was the differences of opinion as to the value of the plant to be bought.

Events, however, during the past three years and over since the new regime was effected, seem to bear out the wisdom of the 90 voters who blazed the way for communal ownership, judging from the testimony of the city's water department books. While it is true that to the present time (April 2, 1902) no reduction from the former rates for water rent has been made to individual consumers, public consumption is no longer a charge. Under private ownership the city paid \$75 per hydrant per year on 66 hydrants, or \$4,950 a year, and \$120 annual water rent for irrigating the cemetery, a total charge of \$5,070 that is now entirely eliminated, and the city now furthermore has the use of six more hydrants that have been set since the date of acquisition, making an actual saving on water for public purposes of \$5,520 yearly—two-thirds the amount of the annual interest on the bonds. The profits to the city from water rents above all expenses during the first two years and three months was \$15,252.51, a yearly net earning of \$6,778.92.

Unfortunately for statistical purposes no inventory of the material on hand has been taken since April 30, 1901, the date of the installation of the present city administration, it being the custom thus far to "take stock" only once in two years, at the end of each administration. Therefore, the books have not been closed since the above mentioned date and the earnings are not definitely known, though it is strongly asserted and, under the circumstances, it seems wholly probable that if a balance could now be had it would show a handsome increase in profits over the last one.

The charge for connecting the property owners with the mains is \$15 on all the streets of the city, with three exceptions, and on these three it is \$20. This is called "service work" and it is claimed that these charges have fully covered the cost of maintenance of the entire system.

During the spring and summer of 1902 it is proposed to materially improve and extend the water system of the city. There has already been received and a portion of it distributed on the ground, 300 feet of 10-inch pipe; 900 feet of 8-inch, 4,000 feet of 6-inch and 1,000 feet of 4-inch pipe. The pipe is figured to cost \$4,558.13 F. O. B. Bozeman. The laying of it will not, according to expert authority, cost more than \$1,200. It is the intention of the city council to expend \$8,000 this year. Under the foregoing estimate there will be available \$2,241.87 for work not yet definitely laid out.

The organization of the water department is made up of one alderman from each ward, four in all, who compose the water committee. This committee is appointed by the mayor "at the first regular meeting of the new council each year." It is "the duty of the water committee to take charge of the general management and have control of the water works, subject always to the approval of the city council." The city treasurer is made water rental collector under bond upon this account of \$10,000. It is his duty to make collections for water rents, keep the accounts "between the city and all consumers of water," together with a record "showing the kind of service, the rate charged and the description of the property on which the water is used," and make a written monthly report of his work to the council.

The water rental rates of the private corporation "shall remain in effect until the gross revenues from the water works together with all taxes levied and collected for water purposes shall exceed operating and maintenance expenses and interest charged by a sum equal to at least 2 per cent of the city's bonded indebtedness incurred for water purposes, except in case of special rates that may be made by the city council." "All amounts due for water shall be a lien upon the property where such water was used and in case such amounts are not paid they shall be certified to the city and county clerks and collected the same as other taxes." In addition to the water rental there is yet collected from property owners, as was the case under private ownership, a water tax of one mill which, last year, yielded a revenue of \$1,921.44.

The only labor expense incurred on account of the operation of the water plant is \$60 a month to the water collector and \$65 to a general utility man.

It has been proposed by the mayor and some of the aldermen to place the water department under a rigid civil service organization in order to remove it from the ambitious hopes of aspiring politicians, disgruntled political

bosses, self-seeking individuals or designing combinations. It is said that a number of leading citizens and taxpayers at the time of the change in ownership strongly urged upon the council the immediate necessity for a water commission but for some reason as yet unexplained, no action looking to this end has been taken.

The complaints against the present management that were encountered in the course of the Bureau's investigation of this subject at Bozeman were: First, the lack of civil service organization; second, that since the city has taken charge there has been no systematic inspection of water consumption and that as a result some are getting their water for less than they should, and by others it is contended that a thorough inspection would materially increase the revenue; third, that there is no need of the revenue received from the one mill tax and it ought to be abolished. At the same time, serious as these complaints may be, according to the estimate put upon them, there was not a single person interviewed who expressed a desire to return to the old method of private ownership. It is, however, such discrimination as the second complaint implies, and such evils as are born of politics, that arise to bring municipal ownership into disrepute. It is equally clear that strict civil service regulations are adequate to meet such evils. In the case of Bozeman it cannot be pleaded that the council has not had ample time in which to discern the exactions of its responsibility in this undertaking, but there is very much reason, judging from expressions of its members, to believe that the civil service idea will soon prevail, under which there can be no excuse for bad management or loose methods and at the same moment the unscrupulous, ambitious and spiteful will be wholly disarmed. It must be conceded, however, even though there is room for improvement, that a net savings and earnings amounting to over \$12,000 annually under municipal, as against private ownership of its water plant, cannot but record all conservative judgment in favor of the innovation.

MINES CITY WATER AND LIGHT.

The Mines City Water and Electric Light Company installed its electric plant in the fall of 1886. The water works were built in 1889. The exact investment by the original company is not obtainable, but from inquiry among those who were nearest the management, it is learned that \$60,000 is a conservative estimate. From the very beginning of the enterprise, and ever since, to obtain an unfailing supply of water has been a problem upon which a great deal of money has been spent. Undoubtedly the very thing that the city last spring voted bonds to do is the thing that should have been done by the private corporation in the first instance, viz., go directly to the Yellowstone river, one and one-half miles for the supply. If it is claimed that the municipality has shown bad judgment in its efforts at securing an adequate supply of water, it can be properly said that the private corporation made the first error in judgment in the matter of the location of the plant and the method by which it sought a water supply. That the city should endeavor to utilize the first location with its improvements was but natural, especially in the light of the fact that each piece of work that was done usually gave at least temporary encouragement toward eventual success.

The first attempt was to bore six artesian wells from 200 to 490 feet in depth, the flow from which was stored in a reservoir well. This proved to be a failure, the reservoir well in reality furnishing more water from surface seepage than the artesian flows. This experience, giving promise of a supply from the reservoir wells, and the fact that the well encountered gravel bearing stratum fourteen feet below the surface that yielded an exceptionally good quality of water, developed the idea of digging two seepage wells which, for a time, did fairly good service, but as the demand increased because of a growing population, these proved unsatisfactory until at last, in 1894, the plant was hopelessly involved in debt and became an asset of the Stockgrowers' National Bank, which held its paper to the amount of some \$45,000, according to competent authority. Notwithstanding the rates were high, the combined business could not be made to pay as a private enterprise. It was a matter of mutual dissatisfaction as between the consumers and the company, for with the scarcity of supply the patrons sought to take advantage of the stringent rules of the company in order to accommodate their needs until the city council was appealed to for an ordinance providing a penalty for violation of the rules, and this relief was granted. But the supply continued at a danger point. In fact from the time that the private company went into the hands of the bank in July, 1894, the bank also having failed and a receiver having been appointed, matters went from bad to worse and nothing was done for the plant or its patrons, except such repairs as were absolutely necessary to the plant in order to keep the machinery moving. Under this status the plant was operated by the receiver of the bank, under instructions of the U. S. Comptroller of the Currency, the evident policy being to realize as much cash as possible in order to reduce the indebtedness of the private company with the bank.

It was under this stress of affairs that municipal ownership found its way to the minds of some of the more thoughtful citizens, the council argued it and finally decided to take some steps in this direction. The receiver of the defunct bank was invited to name a figure at which he would be willing to dispose of the plant, and, in the course of some months of negotiations, the first price of \$22,500 was whittled to \$17,000, which was accepted by the council. A resolution was passed authorizing an election to be held upon the question as to whether or not the city should bond itself for \$20,000 or so much thereof as might be necessary to purchase the plant. In May, 1895, a referendum was had resulting in 344 in favor of bonds and 148 against, a majority of 196 for the proposed new municipal responsibility.

The bonds, \$17,000 in amount, were issued in sums of \$500 each, to bear 6 per cent interest, both interest and principal payable in gold, due in 20 years, but at the option of the city might be redeemed in 10 years. These bonds were sold to Aaron Hirschfield, a local banker, who acted for Farson, Leach & Co., Chicago. The \$17,000 realized from the sale of the bonds was paid to the bank's receiver and the city took possession of the business April 1, 1896.

It has never been the purpose of the city to make money out of the business and upon the advice of the first superintendent for the city, which, by the

way, was demonstrated to be altogether unwise, an immediate reduction in rates was put into effect which, during the first year, amounted to 13.79 per cent, to say nothing of the water and street lighting that was furnished for city use for which no credit was allowed the plant. At the same time repairs and permanent improvements were started at once, which, in the first eleven months, including the bond interest, reached the very considerable sum of \$17,006.86. To get an adequate supply of water for the citizens and sufficient to protect the city against devastation by fire were the paramount objects, and by digging a well 150 feet long, 30 feet wide and 15 feet deep, timbering it with three-inch plank and covering it with a corrugated iron roof, it seemed for the next two years that the problem had been solved. The water thus acquired, seepage through gravel drift, was pronounced the very best in quality and the quantity seemed unlimited. In fact the matter of quantity was passed upon in a professional way by a competent engineer. This well cost \$3,545.72.

The old incandescant dynamo was rated at 650 lights, but was carrying 900 which, if turned on all at once would have wrecked the machine. A new 90-kilowatt Wood dynamo was bought which cost \$1,600. This merely as an example of the formidable responsibility that a less courageous council would likely refused to have assumed.

But again there were breakers ahead. In spite of the bountiful supply of water the new well had habitually furnished at first, it began to dwindle in the second season, the danger limit was again being approached and prompt action was imperative. To meet this emergency an 8-inch, open-joint pottery main was laid 1,500 feet to Tongue river—the open-joint feature being adapted to catch that most desirable quality of water that had come into the large well as seepage. From the Tongue river the water was conducted into the big well on a 9-foot gravity fall in the entire distance. The low, level character of the site upon which Miles City stands is responsible for the great difficulty in securing the water supply. From the big well it is carried to the reservoir well by gravity again, and from there pumped into the city mains. But the Tongue river has a habit of eroding its clayey banks and at seasons of high water so much clay is settled into the big well as to cover its outlet, entailing a regular maintenance expense of several hundred dollars a year for cleaning the well. At an election held on the 7th of April, 1902, further bonds were voted to the amount of \$15,000 for the purpose of moving the plant to the Yellowstone river, where there can be no doubt as to the quality and quantity of the water supply.

The private corporation was furnishing water to 27 hydrants for fire purposes at an annual cost of \$2,650. Now there are 34 hydrants which, under the old contract would cost \$3,325. Under the former ownership the city paid \$972 a year for seven arc lights and four incandescents. The city now has the use of 15 street arc lights and 50 incandescents for which, at the former rate the plant should be credited with \$2,580 annually. That is to say, presuming the same service that the city is now receiving in the matter of light and water were required of the private company, there would be, under the terms of the old franchise, a standing expense on this account of \$5,905 annually.

The most embarrassing feature of the investigation that the Bureau encountered should be mentioned at this point before going further into figures. The figures thus far given are accurate, but to get further into a segregation of expenses of water and light was impossible. For a time the bookkeeper of the old company continued in charge under the city, but the pressure of necessity to procure an adequate supply of water and the comparatively enormous expense, as it seemed to the city council, induced that body to a policy of retrenchment in every quarter where pruning could be resorted to, and the accounts were added to the duties of the city treasurer, together with the collections for both water and light. Later, and at the present time a collector is employed, but in the office of the treasurer there were no books of water and light accounts at all adequate to a reasonable demand. There is no attempt at a distinction between either the receipts or expenses of the water and light departments or between the "Maintenance and Repairs" of the plant and the "Betterments," otherwise known as the improvements that give a permanently enhanced value to the property. In fact there have been approximately \$20,000 worth of warrants drawn upon the "Water and Light" account that do not appear in this account in the treasurer's books at all. In which administration of the city treasurer's office this discrepancy occurred was no part of the business of the Bureau's agent to attempt to discover and this explanation is only made in justice to the Bureau's investigation, realizing that better statistical detail may reasonably be expected than it is possible to give.

Through the courtesy of City Clerk Sam Gordon an approximate separation of charges belonging to "Maintenance and Repairs" was made from "Betterments." This was arrived at by going over each warrant that had been issued on account of the water and light department during the five years and nine months of the city's ownership, from April, 1896, to January 1, 1902, with the result that, as nearly as could be arrived at, \$80,697.88 had been expended for "Operation, Maintenance and Repairs," and some \$23,000 for "Betterments," making a total expenditure of \$103,697.88. During the same period the city is entitled to a credit of \$33,953 on account of the light and water furnished itself. Its revenue from customers was \$62,983.95. Also, in order to make a fair comparison between the private and public ownership it is but fair to allow the city credit for the reduction in rates to consumers, which was 13.79 per cent less than the private company had charged, which may, for the purposes of this report, be designated as "shrinkage in rates," amounting during the same period to \$10,074.80. Also, all the lamps were furnished consumers free under the city ownership until September, 1900, when a change of policy occurred requiring lamps to be paid for, but a 16 2-3 per cent reduction in the cost of all current that was furnished through meters was made—from 24 cents per thousand watts to 20 cents per thousand. It is impossible to say what the credit on the last two items would amount to, as no record was kept of the lamps furnished and no distinction was made between the revenue that came from flat rates and that received from meter customers. The city has, moreover, been very generous in its policy toward the churches, parsonages and hospitals, it having furnished light free to these.

A recapitulation of the figures covering five years and nine months shows the following condition:

DEBIT:	
Expenditures account "Operation, Maintenance and Repairs"	\$80,697 88
Expenditures account of "Betterments," (permanent improvements)	23,000 00
Total Expenditures..	\$103,697 88
CREDITS:	
Water and light furnished for city use at rates formerly paid the private corporation	\$33,953 00
Revenue from customers	62,983 95
Shrinkage, or reduction in rates under those charged consumers by the old company, 13.79 per cent.....	10,074 80
Net saving to the citizens from operation of their own water and light plant as compared with private ownership, to say nothing of the free lamps furnished during four years and a-half, and a 16% per cent reduction in rates to meter consumers during one year and three months, neither of which items can be estimated	\$3,313 87
	\$107,011 75
	\$107,011 75

Among the more prominent items of expense that should be noted in order to give an intelligent idea of the status of the plant may be mentioned the following:

1 250-H. P. Hamilton-Corliss engine	\$3,000 00
1 70 kilowatt Thomson-Houston dynamo, second hand	700 00
1 90 kilowatt Wood dynamo	1,600 00
2 30-light arc, 1,200 c. p. Thomson-Houston dynamo	1,000 00
1 150-Horsepower boiler	1,325 00
1 Worthington Duplex pump, 600 gallons per minute	1,100 00
1 Dean crank and fly wheel duplex pump, 600 gallons per minute	900 00
2 boiler feed pumps, Blake	125 00
New supply well	3,545 72
New suction pipe	734 60
Scales for weighing coal.....	100 00
Acquisition of ground and buildings	500 00
1,500 feet of 8-inch pottery main laid to Tongue river	700 00
3,300 feet of 4-inch water extension pipe and laying	3,693 00
400 poles for replacement and line extension and setting	1,800 00
Estimated value of wire used in extension and labor in stringing	1,200 00
Meters and transformers	2,000 00
Hydrants	1,050 00
Total	\$25,073 32

Though it would not be a proper entry in a set of books of account to charge all these items—including freight and transfer charges, of which no mention is made, and labor in setting up the machinery, which is only estimated in part—wholly to the "Betterment" account, it would, in a sense represent a truthful condition. Notwithstanding the city paid \$17,000 for the plant, it must not be overlooked that the demands upon the machinery and for the extension of the systems, as a result of a growing community, caused replacement and additions of new and larger appliances all the way through. In any event the original investment is entitled to a credit of the amount realized from the superseded machinery, but this has not been given and at this time it cannot be estimated.

From the foregoing it is apparent that the city's investment was warranted and her citizens have been financially benefitted in addition to receiving a greatly superior service in both light and water, in spite of the vicissitudes of the water department, which has been the source of probably 80 per cent of the city's trouble, and yielded possibly not more than 20 per cent of the revenue.

In the management of the municipal plant diligent inquiry developed convincing testimony that at least so far as the citizens are concerned, they have

been immeasurably better treated and no effort has been spared in their behalf. That the council's management of the plant is approved by the taxpayers, and that whatever mistakes have been made are not considered of an unpardonable character, is evidenced by the result of the election last April at which it was decided to again bond the city for \$15,000 in order to obtain a water supply from the Yellowstone river. The vote stood 126 in favor of these bonds and 47 against. The council's policy has been of a generous character all the way through. Its chief effort has been to accomplish an acceptable service and whatever may be said of the misfortunes of the water department, it cannot be denied that the quality of light furnished is as good as any in the state and better than some of the private companies at other towns.

The station force comprises four men now, as formerly, notwithstanding the increased business of six years of normal growth of the city, and the compensation has been raised from \$315 to \$395 a month.

Special rates for lights have been granted in instances where circumstances have seemed to justify them, but these instances have been few and nothing approaching partiality is suspected.

The organization for the conduct of the plant is not of a character that guarantees it from political interference, such as a rigid civil service commission in charge would do, but in reviewing the council minutes there is a notable unanimity of purpose apparent in the votes taken upon matters pertaining to this department. Thus far the enterprise appears to have kept practically free from political favoritism and prejudice.

GREAT FALLS WATER WORKS.

November 3, 1898, the city of Great Falls took over the plant of the Great Falls Water Works Company, together with its real estate, good will and all rights and privileges which were granted the original incorporators under its franchise obtained from the city March 26, 1889. Payment was accomplished by the issuance of bonds voted at a special election held August 20, 1898. The bonds were made into denominations of \$1,000 each, one-third of them becoming due July 1, 1908; one-third July 1, 1913, and one-third July 1, 1918, all bearing 5 per cent interest and payable in lawful money of the United States. The issue was sold for \$10,105 premium and accrued interest amounting to \$6,421.21, making a total realized on the issue of \$391,526.21. The remarkable feature of the election was the small vote, there being only a total of 220 votes cast, 189 in favor of and 31 against the issuance of bonds. It is impossible to ascertain the number of persons eligible to vote upon the question at the time, but at a conservative estimate it is believed that not more than one-fifth of the taxpayers availed themselves of the opportunity to give expression to their convictions. This fact seems remarkable for the reason that at times during four years prior, the general public became involved by way of petitions to the city council, both for and against the purchase. Mass meetings were held, legal proceedings were had, a statutory enactment was passed by the Legislature which had its origin chiefly in this controversy in which business men and labor organizations had participated, and which finally, in the spring of 1897, had become a political issue, a fusion of populists

and democrats having carried the day upon a municipal ownership platform which transferred the reins of city government from the hands of the republicans.

While there had developed a considerable sentiment in favor of municipal ownership in certain quarters it is undoubtedly true that the activity of the tax-paying interests in this behalf arose from the fact of the rapid growth of the city which had spread over a large area making long extensions of mains to new additions necessary. Great Falls increased its population from 3,979 in 1890 to 14,930 in 1900. It was one of the provisions of the water company's franchise that it should establish 10 fire hydrants to each mile of main laid. The price the water company was to receive for hydrant rental was \$90 per hydrant per year for the first 75 hydrants and \$60 per year for each additional hydrant. The city had exceeded its statutory limit of indebtedness and hydrant rental to the amount of \$17,826 a year threatened disaster to the municipal treasury and goaded the city fathers to little short of desperation at times. Appeals were made to the water company for a reduction in charges but this the company felt obliged to deny claiming that its earnings had all been reinvested in the plant by way of improvements in facilities including the extension of mains and, therefore, no dividends could be declared to the shareholders of water company stock. The enthusiastic activity of real estate men in plotting and selling lots as far as eight and ten blocks beyond the original townsite and its addition, with no occupancy of the intervening ground, had brought grief to both the city and water company. The company felt justified in insisting upon the terms of the franchise ordinance which gave it the right to establish and charge for 10 hydrants to each mile of mains laid, whether the mains should pass through settled or unsettled districts, and the city felt that some concession was reasonably due in spite of the terms of the franchise. The result of this condition of affairs was that the city refused payment of six months' hydrant rental in 1895, the company carrying a suit upon the issue to the State Supreme Court which awarded the company a judgment for its claim and costs of suit amounting to \$9,220.83. During the years 1894 and 1895 negotiations looking to the purchase of the plant had been attempted at intervals, but in each case failed, the company valuing the plant, franchise, real estate and good will at \$500,000. The successive failures to negotiate with the company gave rise to discussion upon the proposition of building an independent plant by the city and an election was about to be called to vote bonds for the purpose when an overwhelming opposition appeared in the form of a petition purporting to represent more than one-half of the city's taxable property was presented to the council asking that further consideration of the water question should be postponed until July, 1897, and urged the council to pass such "solemn and binding" resolution which was done. A feature which entered into this suspension of proceedings was the fact that certain localities were demanding main extensions and the plant needed repairs and supplementary machinery which the company did not feel it could safely invest in except the agitation for building a separate plant was effectually quieted for a definite time.

It is also probable that the influence of the president of the Montana Central Railway, whose residence is in St. Paul, had due share in this suspension of activities, he having telegraphed the council as follows:

"St. Paul, September 30, 1895.

"The Honorable City Council,
"Great Falls, Montana.

"It is to be hoped that action increasing the city's debt will not be taken without due consideration. Your city being now supplied with water, nothing can be gained by ownership of plant unless you claim to operate the works cheaper than an able business man like Mr. Phelps. Great Falls looks to eastern capital to develop. Increasing taxes will keep out investors. Leave for Boston to-night to confer with parties desiring to locate manufacturing plant in your city. Heavier taxes will not offer an attractive inducement.

(Signed,)

"SAMUEL HILL."

A scrutiny of the council's minutes from the time of the passage of this resolution, October 5, 1895, to July 1, 1897, bears evidence of the good faith in which this resolution was carried out. With the incoming of the new administration, however, the matter was again up in earnest, and in behalf of the pledges made in the spring campaign, on June 14, 1897, a resolution was adopted by the council that the mayor appoint a committee of seven to consist of himself, three members of the council and three resident taxpayers to investigate and report: "First, the cost, character, capacity and condition of the existing water plant and its present value; second, the amount of a bonus, if any, which should, in fairness, be paid the Great Falls Water Works Company in addition to its actual value; third, the advisability of the city purchase of the existing plant at such price as an investigation of the two preceding queries may establish as fair; fourth, the practicability and wisdom of independent construction of a plant at this time by the city."

As a result of the work of this committee it was agreed to offer the company \$340,000, which was refused. This refusal led to renewed activity in the line of building a new plant, figures for which were submitted by the city engineer who estimated the cost of a direct-pressure system with modern filter and standpipe, with the Missouri river as the source of supply, would be \$257,920, and with the Giant Spring as the source, at \$254,100. At the same meeting at which these estimates were reported the president of the water company signified his willingness to make a considerable reduction in the price of the water plant and at the next meeting named \$400,000 as the modified price. It had taken a year for negotiations to reach this stage, it now being June, 1898. On June 13, 1898, the council offered to make "some slight concession over its former tender of \$340,000 in order to bring about a speedy settlement of the entire question." On June 23, the president offered the plant at \$375,000; a counter offer of \$357,000 was made by the council, which was refused, and at this meeting, June 27, 1898, a reconsideration of the proceedings of the evening in this particular was had which resulted in the council and the water company agreeing upon \$375,000 as the price.

As to the value of the plant at the time it must be admitted that all the evidence of record goes to show that the price paid was high if only the machinery, mains, etc., were to be taken into consideration, for it had been

carefully figured by the city engineer and a competent associate that the plant could be duplicated new for \$223,935.74, and this amount was figured as "very liberal" and would "afford a contractor a fair profit." One council committee reported the old plant worth only \$200,000 after allowing for depreciation. But the company established the fact through an expert accountant that the plant had actually cost it \$330,000. And, again, there were many who believed that the water company was entitled to something for its franchise privileges which the people had given it in 1889, and which was to run 20 years, but with an option that the city might buy the plant at the end of 15 years, which would have brought the time to 1904 before the city could have acquired peaceable possession. Therefore, the water company was deprived of five years' business under its franchise which privation a good many people felt, rightly or wrongly, was cheaply paid for by the city. In any event it was a long and disagreeable contest closed and, all in all, everyone who had been directly connected with it was glad to compromise and dispose of the issue.

Immediately upon the acquisition of the plant the city reduced the rates for irrigation one-half and on the first of April, 1899, a general reduction for the use of water, except for irrigation, of 20 per cent was made, and these rates remain in force at this date. A clear idea of the advantages gained by the purchase can be best shown by a comparison of the cost of water to the community of Great Falls as it would have been, had the plant remained in private hands, and what it has actually cost the people since they have owned and operated it themselves.

At the old rates, and there is no reason to believe that these would have been in the least modified under private management, the people would have paid for water for private use during the 38 months from November 3, 1898, to December 31, 1901, \$111,566.23. Under municipal ownership and operation they have actually paid \$92,789.54, a saving of \$18,776.69. Tap connections would have cost \$1,961.10 in either case. Shut off penalties, under private management would have cost \$266.00; municipal, \$332.50, the city charging \$2.50 for turning on water that has been turned off as a penalty for some offense against the rules of the department as against \$2 charged by the former owners, an additional cost of \$66.50. Under the old company the taxpayers would have been levied upon for rental of 259.6 hydrants which was the number set at the time of taking over the plant which, in the 38 months, would have amounted to \$56,449. In addition to these there would have been put into commission 15 hydrants from time to time which it will be fair, not having exact data as to their setting, to average as 7.5 hydrants during the whole time, which would have cost \$1,424 or a total expenditure of \$57,873 upon this account. This item of expense, however, was in part defrayed by a special tax upon the value of all the taxable property in the city. This special tax was, in 1898, one and one-half mills and there is no reason for believing that under the former regime it could ever have been lessened during the term of franchise. This in three years would have brought \$25,932.75 to the "Water Fund" account of the city to be paid over to the private corporation. This would still leave the city owing the water company \$31,940.25 which

must be paid from the "General Fund" which is also kept in working order by the people through the machinery of taxation. Under the operation by the city the special water tax has been derived from one mill a year during 1899 and 1900 and one and a half mills for 1901, and this has yielded a revenue of \$20,146.03. There being no hydrant rental to pay this is now applied to the interest upon the bonds or any other expense that it may be appropriated to cover in the water department. Therefore, there appears to be an aggregate saving of \$5,786.72 upon the special levy for the "Water Fund" and a further saving of \$31,940.25, the difference between the hydrant rental and the taxes collected, that, under private ownership, would have to be paid from the "General Fund" on account of hydrant rental. In other words, the community would have been taxed \$57,873, all of which would have been paid out for hydrant rental to the private corporation, under former arrangements, whereas, under public ownership, the community has in fact only paid \$20,146.03 on this account; hence, a saving of \$37,726.97. In this connection, however, it is but fair to state that the water company itself in the year 1898 paid \$892.40 taxes to the city and a license of \$200 per year, a total of \$1,092.40. Upon this basis the water company would have paid the city during the 38 months here under consideration \$3,459.27, which, under municipal ownership, is lost. In this view it would be more truthful to reduce the saving of hydrant rental to \$34,267.70.

It is the present custom to charge a 10 per cent penalty against all water rents that are not paid by the 10th of the month in which the water is used. This was not formerly so and, therefore, \$735.65 becomes an added charge against the delinquent citizens of the community.

Comparative Statement Showing the Estimated Saving in the Cost of Water to the Community of Great Falls for Approximately 38 Months of Municipal Ownership and Operation from November 3, 1898, to December 31, 1901:

Cost to the People Under Private Ownership.

Water for private use	\$111,566 23
Tap connections.....	1,961 10
Shut off penalties	266 00
Hydrant rental, less taxes (see next item for taxes).....	31,940 25
Taxes for water purposes	25,932 75
	<hr/>
	\$171,666 33

Cost to the People Under Municipal Ownership.

Water for private use	\$ 92,789 54
Tap connections	1,961 10
Shut off penalties	332 50
Hydrant rental	
Taxes for water purposes	20,146 03
10 per cent penalty	735 65
	<hr/>
	\$115,964 82
Taxes and license formerly paid by the Water Company, now lost to the city under municipal ownership ..	3,459 27
	<hr/>
	\$119,424 09
Saving to the people under municipal ownership.....	\$ 52,242 24

The above shows an average saving to the people of Great Falls of \$1,374.-80 per month or, \$16,497.60 per year during the 38 months. That is to say, the people have that much more money in their pockets to-day than they would have had if the plant had remained under private ownership, regardless of whether the practical operations are as economically managed as under private ownership or not.

Since the city purchased the plant a large amount of money has been expended in repairs, a considerable amount in the year 1902, which is not taken into account. The pump station building has been thoroughly overhauled and the machinery and boilers have undergone systematic renovation, practically all the wearing parts having been replaced so that the plant is in very much better shape than when it was bought. Up to December 31, 1901, for instance, \$3,000 had been spent on the pump station building and \$6,000 had been expended on the machinery and boilers. Further permanent improvements are contemplated such as the construction of a large settling reservoir, the extension of mains and enlargement of some of those already laid, and some new machinery. Partially for these purposes and particularly to inaugurate a separate pumping plant for the beautiful park system for which Great Falls is becoming famous, another bond issue of \$45,000 was this spring voted.

In the matter of water service to the citizens there does not appear to be a great difference between the two managements. The greatest cause for complaint formerly, as now, arose from residents in the additions which are located some 150 feet higher than the original townsite and more or less difficulty in obtaining an adequate pressure during the high tide of irrigation is encountered now as then. The remedy adopted is also the same, viz., to stop the waste of water in the parks. There has never been occasion to limit the quantity used by consumers. There is no limitation in the hours for lawn sprinkling and unquestionably there is great abuse of this privilege. The private company furnished free water to city buildings, for sewerage, for parks and trees on the avenues, when means were provided for the conveyance of water to them. The city now, however, uses a large quantity more of water for all these purposes than formerly and provides also for the public library, watering troughs and North Side fire station. There is said to be approximately 90 acres of parks more or less under water and eight miles of boulevard and trees watered at the present time. For the year 1899 the average quantity of water pumped daily was 1,282,970 gallons at \$67.56 per million gallons; 1900, 1,328,453 gallons at a cost of \$75 per million, and in 1901, 1,818,323, were pumped daily at a cost of \$68.81 per million gallons.

The conduct of the water department is vested in a Board of Water Commissioners consisting of three members, not city officials, and no two of whom may belong to the same political party and who shall act without compensation. They are appointed by the mayor and confirmed by the council; term of office, three years. The Board employs a suitable secretary from outside their number whose duties are to make all the collections and take complete charge of the accounts. And here it will not be out of place to say that the accounts of the Great Falls Water Department are the most com-

petently kept of any in the State of this character. Too much cannot be said for the system which has been inaugurated in the office and the painstaking manner in which it is kept up. Any detail of information can be furnished the water commission or the city council at almost a moment's notice. All contracts of the Board are binding upon the city when approved by the city council and it has general charge, management and control of all water department affairs subject only to the control of the city council. They may hire and discharge any employe provided that cause for such discharge can be shown. They, subject to the council's approval, "regulate the distribution and use of water and fix the price and rate therefor; provided that the present rates fixed by the Great Falls Water Works shall remain in effect until the gross revenues of the water works derived from private consumers, together with all taxes levied and collected for water purposes shall exceed operating and maintenance expenses and interest charged by a sum equal to a least 2 per cent of the city's total bonded indebtedness incurred for water purposes." The first provision of this ordinance requiring rates to be maintained was repealed and the sinking fund provision has been disregarded. The wisdom of this action is yet to be determined, but in view of all the facts that were brought to light in this investigation, it would seem to have been a serious mistake to make an immediate reduction in the rates for water, especially as they were not abnormally high. If the rates had been maintained there would now be more money to the credit of the water department than it is getting out of the latest bond issue, and it would cost no interest; whereas, this issue of bonds bears interest at the rate of 5 per cent, payable semi-annually, and at the very best terms obtainable the city must now pay \$2,250 a year interest on these for 20 years, they being straight 20-year bonds, or a total of \$45,000 in interest alone, or \$90,000 principal and interest for the improvements that are proposed to be made from this bond issue.

However much the economic student might be disposed to criticize this status, the fact still remains that in spite of mistakes in management, if mistakes they shall prove to be, the people of Great Falls have saved themselves more than \$52,000 in 38 months of ownership of their water plant which would seem a sufficient justification for the undertaking.

FORT BENTON WATER WORKS.

A franchise was granted by the city of Fort Benton to Geo. F. Woolston for the construction and operation of a water works plant July 15, 1887. There were three and one-half miles of mains laid and a pumping plant erected at the Missouri river which was to be the source of supply. It was also stipulated in the franchise that 25 hydrants should be installed for fire purposes, the rental upon which was to be \$100 each per annum; \$75 for all over 25 and under 100, and \$50 each for all over 100. The growth of the community has not, however, necessitated the addition of hydrants since the original plant was completed. In those days Fort Benton was the northern terminus of Missouri river transportation and for this reason the center of Northern Montana commerce which furnished a basis of thriving social and industrial conditions. With the building of the Montana Central Railway

the seat of Northern Montana commercial activity was transferred to Great Falls, leaving Fort Benton from that time on to be occupied by homes of stockmen and the usual mercantile concerns that are dependent upon agricultural and stock raising industries. While the result has been a material decrease in the floating population, there has been an increase of substantial homes—some of them beautiful—but the original townsite covered by water mains has been able to meet all demands for new home and business buildings.

The original franchise grantee, it appears, became involved with creditors and his ownership was transferred to Messrs. W. G. and C. E. Conrad, the chief western creditors, and from these gentlemen the plant was bought for \$12,500, they accepting the city's bond for this amount at 7 per cent interest to be redeemable in 10 and due in 20 years. At the election at which this bond issue was authorized the vote for bonds was 54 and none against. The city took charge of the works September 1, 1893.

There is no way by which an accurate comparison of the private and public corporations can be made in point of finance for the reason that under municipal ownership it has been the custom to credit the water revenue to the city's "General Fund" and charge this fund with all expenditures, no separate account ever having been carried for the water department. It is said, however, that water rates were somewhat reduced to consumers and much money lost to the city by reason of neglect of inspection of the supply furnished consumers and other inattentions to business methods. There is, however, very little expense attached to the operation of the plant and whatever there is could not be lessened by any management. It being a pumping plant, two men are required at the pumping station at firemen's wages; the accounts are handled along with the other accounts of the city by the city clerk and treasurer and the rents collected by the city marshall for which he receives a small compensation in addition to his pay as a police official. He also acts as general utility man in the matter of laying and repairing pipes, etc.

During the summer of 1902 a council committee estimated an approximate loss of \$600 a year on account of the water department whereupon the council made an inspection of the supply going to all consumers, and revised contracts. In instances there were revisions of rates but the greatest feature contributing to loss, it transpired in the course of the committee's investigation, had been that, as water facilities had been added to business houses and residences the charges that should have accrued were neglected.

A good deal of expense has fallen upon the city in making repairs and replacing old pipe that either was a poor quality when it was originally put in or has been corroded by the alkali soil in which it lays, or both, which has required an extra force from time to time to keep the mains in repair, and more or less expense in the purchase of new pipe.

The water rates for private houses are about 80 per cent higher than it was proposed to charge in the original franchise under private operation, but lawn sprinkling is about 16 per cent less. But since the enterprise apparently bankrupted its promoters it could hardly be expected that the plant could be made to pay dividends by the municipality without some sort of

readjustment of conditions. The fact is, there are not enough consumers to make it a profitable business enterprise, but the people are getting a bountiful water supply and, as they express it, "We are willing to pay for it; no one could furnish it to us cheaper than we can supply ourselves."

WHITE SULPHUR SPRINGS WATER WORKS.

White Sulphur Springs was the first town in the State to undertake the construction of a water plant in a municipal way. Theretofore each of the plants that came into possession of the people had been originally constructed by private enterprise. A survey was ordered by the city council of White Sulphur Springs May 14, 1896, and March 8, 1897, the council passed a resolution by a vote of three to two, providing for submission to the people of a proposition to issue \$30,000 bonds for the construction of a city water works at the next regular election, April 5, following. It is said that the greatest opposition to the project arose from the business community, but the specific reasons for this opposition could not be satisfactorily discovered at this late day as, among the former opponents interviewed, various reasons were given for their attitude each standing upon his own judgment at the time. Nothing having the appearance of organized effort to form a private in preference to a municipal corporation seems to have inspired the opponents, but some appear to have entertained the common impression that none but private combinations of capital are capable of handling large enterprises and ministering to the public needs; some thought the water source could not be legally held and others felt that the whole scheme was impracticable "on general principles." Characteristically enough, however, not a person interviewed had a word of fault to find with the practical operation of the plant or the service he was individually getting. Not one wanted to be deprived of it or turn it over to a private corporation. The water works have done so well and proven such a convenience that it is now proposed to hasten the payment of the water bonds in order that sewerage bonds may be issued and thereby another public utility will come under the care of the city fathers for the people.

The water bonds proposal was ratified at the April election by a vote of 43 to 28. They were lawful money, 10-20, 6 per cent bonds. The plant was completed and entered upon its mission of convenience and comfort to the people June 1, 1898. It is a gravity system and the only trouble has been too great a pressure. This has been overcome by putting in three pressure regulator valves.

A four-mill tax has been levied upon all the property in the city each year which, in 1898, amounted to \$1,158.94, and has gradually increased until, in 1901, it yielded \$1,939.57. This is placed in a sinking fund out of which the bonded debt is to be paid and, in fact, \$5,000 has been paid and \$1,500 more is negotiated for.

The accounts of the water department along with the other departments of the city are kept by the city treasurer and the collections for water rents are made by the city marshall, the latter also doing the general utility work that is needed upon the system. While the accounts appeared to be correct so far as balances and closing were concerned, they were so meagre of detail

as to be of little assistance in a statistical way, and in at least one instance money that was paid into the city for the benefit of sundry funds was credited to the "General Fund," and that portion of it that belonged to the "Water Fund" was disbursed directly from the "General Fund" instead of putting it through the "Water Fund" account. This, to be sure, was but a short method, the financial facts remaining the same, but the actual status of the "Water Fund" account is necessarily destroyed. The fact that the treasurer's salary is only \$50 a year, however, would seem to be sufficient justification for brevity of details.

As nearly as could be ascertained the total receipts for the four years to June 30, 1902, from water rents and taxes were \$14,424.12 of which \$6,286.01 was derived from taxes, leaving \$8,138.11 as revenue directly from rentals. The operating expenses, including interest on the bonds, during the same period, amounted to \$8,216.67, leaving a deficit as between water rentals collected and the operation of the plant of \$78.56 in four years. Considering the size of the town and the rates at which water is furnished, this is certainly a satisfactory showing, and this with a strong probability that even more than the amount of the deficit may have been put into permanent improvements but charged to operating expenses.

Before the water plant was constructed White Sulphur Springs was a barren, treeless town with the exception of less than half a dozen lawns owned by wealthy residents, who could afford expensive pumping plants propelled by wind. Now it is a pretty little place having some 600 inhabitants, decorated by beautiful groves and nice bluegrass lawns and the people freely assert that their comfort and convenience has been enhanced an hundred fold.

HELENA WATER WORKS.

In the city of Helena the local water company was granted a 20-year franchise on the 20th of January, 1890. During the year 1895 an election was held and a majority of the taxpayers voted in favor of municipal ownership. Immediately following such election an effort was made by the council to acquire a water plant upon a competitive basis. At that time, however, the law provided that cities desiring to embark in the water business must purchase the existing plant, and in accordance therewith the local water company enjoined the city from advertising for bids. The courts were resorted to and it was finally held by the Supreme Court of the State that such provision of law was unconstitutional. At the time the law referred to was in force, the water company's price for its property was \$1,386,000, but after the court decision was rendered it offered its property to the city for \$900,000. Subsequent to the last offer the question of extending the debt limit 10 per cent, as provided for in Subdivision 64 of Section 4800, was voted upon. The proposition was defeated sometime during the month of September, 1899. A month later the question of extending the debt 5 per cent, which was equal to \$614,000, was submitted and carried. Under the authority given by such election to the council bids were advertised for, but none were received from the water company. In October, 1900, with a view of acquiring an independent supply, the city instituted condemnation proceedings for the purpose of acquiring the waters of McClellan creek. These cases

are still pending. In April, 1900, the city purchased the waters of Beaver creek for the sum of \$30,000 and contemplates bringing the same to the proposed point of diversion on McClellan creek, at which point the size of the main will be increased sufficiently to carry both streams to the city and which will supply in the neighborhood of 500 inches. Estimates of cost have been made upon a barrel-stave pipe line from Beaver creek to Helena—the cost of a masonry reservoir; the cost of a complete distributing system throughout the city, in accordance with the plans and specifications which have been prepared—and aggregate in the neighborhood of \$535,000.

LEWISTOWN WATER WORKS.

Lewistown held a special election November 1, 1901, at which a \$50,000 bond issue was authorized by a vote of 50 to 1. These bonds are 10-20's bear 5 per cent interest, both interest and principal payable in gold, and were sold to the Bank of Fergus County, a local bank at Lewistown.

The issue was authorized for both water and sewerage, no specific amount being named for each. Construction work began in June, 1902, and the water system is to be completed by November 1, 1902. The source of supply. On September 30, another election was held and by a vote of 46 to 7 reservoir located on high ground and from there conducted to the town by gravity. The mains used are of wood, bound by quarter-inch wire. The expediency of wooden mains was resorted to at least partially as a matter of present economy in freight, Lewistown being located 65 miles from the nearest railroad station. This is the only instance within the Bureau's knowledge where wooden pipes have been used in the State. The system of mains will be about five miles in length.

RED LODGE WATER WORKS.

On May 1, 1899, the taxpayers of Red Lodge voted in favor of the issuance of \$25,000 bonds for the purpose of constructing a water works system. These bonds are redeemable in 10 and due in 20 years and bear 5 per cent interest which is payable semi-annually. The issue was dated October 2, 1899. This amount of money was found inadequate for the undertaking and accordingly, in order to furnish the necessary funds with which to complete the project, an election held July 16, 1900, resulted in a vote of 51 to 42 in favor of a second issue to the amount of \$10,000 10-20 bonds, 5 per cent interest, both principal and interest payable in lawful money.

The source of supply is Rock creek, two and one-half miles above the city, and the system is gravity. There are five miles of mains laid the total cost of construction reaching about \$38,000, and it is said that less than \$200 has been required to meet the expense of repairs during the first year and a half. Water was available for use October 1, 1900, and it is claimed by the city officials having the water works in charge that the revenue is more than sufficient to meet the interest on the bonds and operating expenses.

PHILIPSBURG WATER WORKS.

A special election was held at Philipsburg May 28, 1902, at which it was decided by a vote of 76 to 17 that the city would own its own water supply. On September 30, another election was held and by a vote of 46 to 7 a bond issue was authorized for the construction of a new plant, or the pur-

chase of what is known as the Kaiser plant, which has been in operation as a private enterprise for some years. The amount of the bonds authorized was \$30,000, and in the event that the Kaiser plant is to be purchased a partial negotiation has been made at \$20,000, it being understood that \$10,000 will be used in repairs and extension of the old plant. Otherwise the whole amount of the issue will be used in the construction of a new plant which, it is believed, is not likely. The bonds will bear interest at the rate of 6 per cent and are to run 20 years. The Kaiser plant is a gravity system and its original cost is said to be from \$35,000 to \$40,000. There are 18 fire hydrants for which the city has been paying \$173 a month, \$276 a year more than the interest on the entire bond issue will amount to. At this writing it is not known upon what terms the bonds will be sold or to whom, nor the date that the city will enter upon possession of the property.

DILLON WATER WORKS.

The city council of Dillon unanimously passed an ordinance January 2, 1902, providing for the bonding of the city for \$24,000, the bonds to bear 5 per cent interest, dated July 1, 1902, and become due in 20 years. The vote upon this proposition was very light, only 100 out of a possible 200 registered, and about 20 per cent of these did not vote. The ballot stood 46 in favor of the issuance of bonds and 35 against. Mr. Frank M. Kelsy of Salt Lake has been employed as expert engineer to report upon the feasibility of a gravity system, a preliminary survey having been made to Grasshopper creek 10 miles distant from Dillon, and if his report is favorable the city council will ask for \$20,000 additional with which to construct the works. Another election will be held in this connection February 10, 1903.



A RESIDENCE STREET IN DILLON.

SOCIOLOGICAL.

The analysis of the sociological statistics of the prisoners confined in the State's prison at Deer Lodge reveals some surprises which are seemingly in direct contravention to accepted theories relating to convicts. This is perhaps more true regarding matters pertaining to the education of the inmates at Deer Lodge than of any other branch of the investigation, but in various other parts of the tables will be found deductions which students of prison statistics will find valuable.

In the current report of the United States Commissioner of Education, Vol. I, will be found tables giving the average of years of 200 days each of education received by each inhabitant of the United States. If all branches of education be included it is shown that this average for the Western Division which is comprised of Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Washington, Oregon and California, is 5.82 years for each individual. Taking into account only the schooling furnished by public elementary and secondary schools, the average of attendance drops to 5.23 years for the same district; while the average for the entire country, regardless of district classifications, is only 4.99 years. These averages, however are not up to those shown by the Deer Lodge investigation where the average schooling for all the inmates is shown to be 5.7 years.

Of the 369 prisoners whose records are shown, 27 are serving life sentences. The average schooling for this number who may readily be supposed to form the most depraved or vicious class, is 5.59 years. There are seven inmates whose sentence is equivalent to life, and whose average number of years of school is 4.86, and the average of these two classes is 5.44 years. The table shows that these few years of schooling were had during an age when only the primary education was possible, and it is found that the life prisoners had an average of 5.44 years as against the general average of the United States of 5.23 years, while that of all the 369 prisoners confined mounts up to 5.7 years.

These facts certainly indicate a comparatively high degree of education among these convicts, and, unless the ground is taken that the whole country lacks school advantages, there is little, if any, reason for connecting illiteracy with crime in Montana. It seems only fair, however to agree with most students of these questions that higher education is confined to a very few, and that the great mass of citizens receive only an elementary education, and are, therefore, more open to criminal influences. It has been said that a little learning is a dangerous thing. 94.37 per cent of the entire population of the United States is deprived of all but the rudiments of education. And in this connection it is suggested that the questions of child labor, shorter hours of employment and compulsory education play a most important part. Thorough education of its citizens is a grave state duty. It is no more a question of charity than is fire or police protection, and it is incontrovertably

the duty of this government to see that the average attendance at school is raised above 4.99 years.

Of the 27 who are serving life sentences 21 were born or raised in town or city, a fact which seems to point conclusively to the superiority of country over city in the matter of chaste environment. These were also under very little Sunday School influence as their average attendance was only up to three and one-half years of age. Murder in the second degree is the charge against 24; two were convicted of rape and one of first degree murder.

The tables of ages of prisoners shows that there are inmates of almost every age from 15 to 90. Four claim to be but 15 years of age and one of 17. Every age from 20 to 56 is represented, the largest number of any particular age being 19 who are 34 years old. The oldest prisoner is 90, the next oldest 76 and the next 72. The average age of all inmates is 34 years.

The table of nationalities shows that the United States is responsible for the birth of a large majority of the convicts, 237 of the total number having been born here. Canada contributed 25, Ireland 22 and England 20. Nearly every country of the world is represented in the remainder.

The table of nationalities shows that the United States is responsible for the birth of 237 or 64.23 per cent of the total number of convicts; 132, or 35.77 per cent are of foreign birth. 72.44 per cent of the population of Montana are natives of the United States and 27.56 per cent are of foreign birth, thus showing a greater percentage of convicts of foreign birth than of native, per capita of population, of each class.

It seems rather remarkable that of all the inmates at the prison but five were born in Montana and all of these are serving sentence for the first time. It is hardly less notable that the aggregate sentence of these men is only 10 years. Necessarily a very large proportion of our population comes from other states and the conditions under which many are obliged to exist in the Eastern states engenders among some a spirit of carelessness, recklessness and in some cases actual lawlessness. Our vast territory, much of it wild, unsettled and almost impenetrable, affords many opportunities for escape and freedom after the commission of crime which doubtless attracts men whose career of crime began in other states.

In considering the former occupation of convicts attention is called to the fact that a large proportion of them were engaged in the lines of business which afford the least opportunity for education and improvement. Common laborers, cow boys, teamsters and farmers lead, and it cannot be denied that the environments in these callings are generally such as to lack refinement and inducement to self-culture; but perhaps the most striking feature of the whole report is the fact that there is only one inmate whose occupation is that of saloon-keeper and only three who are bartenders. This is a class of citizens who are very frequently referred to as lawbreakers and criminals and yet the table shows that whatever the estimate of the people may be the men who are conducting the saloon business of this State are not given to crime.

The religion of the convicts also forms the basis for an interesting study. Almost one-half, 148 out of 369, disclaim any religious influence whatever. 186 of the prisoners never had the advantage of Sunday School instruction. Those attending between the ages of 5 and 11 years comprise 35.50 per cent

of the population of the State's prison while 14.09 per cent attended between the ages of 11 and 29, inclusive. Of those who do profess some faith or claim to have been taught some religion the Catholics lead with 89, and of this number 51 are of foreign birth, 34 are natives of the United States and four American Indians. The Methodists follow with 41, the Presbyterians 28, Lutherans 18 and the Episcopalians 16. In the list are most of the other denominations including three Salvationists, one Mormon, one Atheist and one Deist.

Many changes have been made in the treatment of prisoners throughout the United States in recent years, practically all of the modifications being in recognition of the fact that a prison should be a reformatory rather than a purgatory; that a successful prison system is one that restores its inmates to the world as useful citizens, convinced that crime does not pay, and anxious by a clean, wholesome life to redeem their past errors. Those who fail to understand the nature of the reforms which have been adopted in certain states are apt to complain that prisoners are encouraged in a criminal career by the fact that the prisons are made too comfortable; that these institutions should be made places of terror and that cleanliness, air, light, sufficient food, good books and papers are simply inducements to crime. If mere punishment is the aim then it were wiser to return to the old methods of whip and rack, put the offenders into stocks and pillories, crop their ears, take away their property, divorce them from their families, deny their civil rights or even dispatch their lives at once. If revenge and punishment is the idea, then there is no logical limit to which society may not decree its vengeance. If to reform the vicious is the purpose, then it would seem as logical that no pains should be spared in humanitarian efforts to this end, and reform is unquestionably more in keeping with the Christian sentiment of the day, else the brutal punishments would not have given away as civilization has progressed. That the brutal punishments have not operated as greater deterrents to crime than the mere privation of liberty has been proven in instances where the most brutal of all, that of capital punishment, has been abolished. History shows that severe punishments neither prevented crime or saved society. The severer the laws the worse the behavior. When stealing was a capital offense thieves abounded in every city; they were at times in every street; they picked pockets in churches. Property was not safe either in the home or on the person; highwaymen infested almost every road. As laws modify and the sacredness of human life is better appreciated, the causes of offense diminish in about that ratio and privation of liberty is conceded by the majority to be punishment enough and society is fully protected thereby.

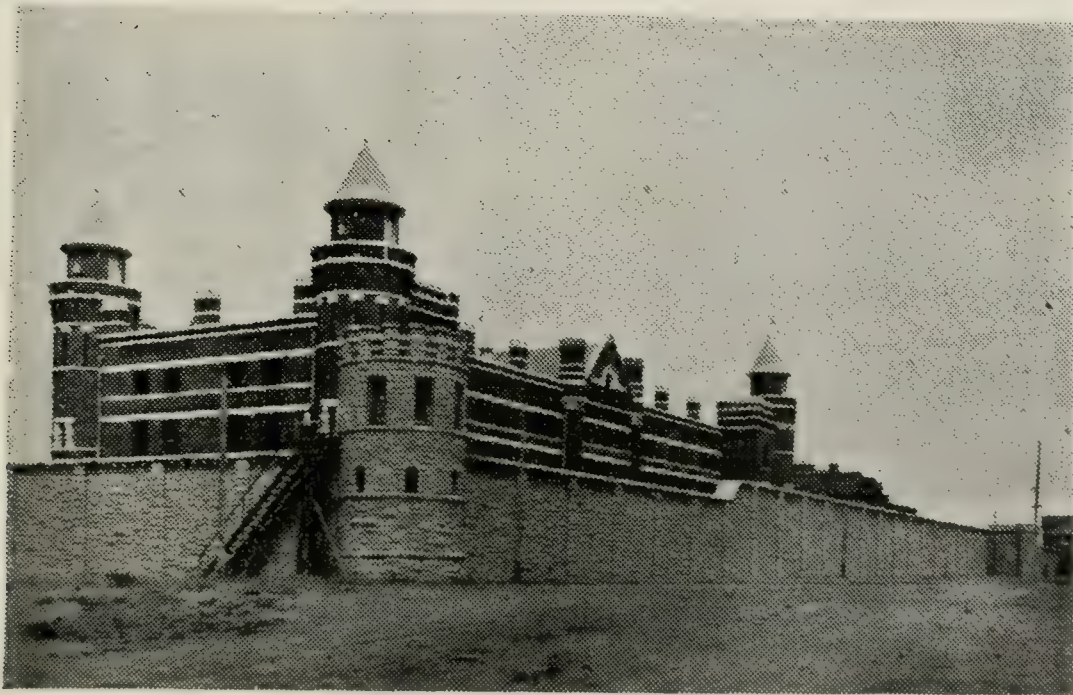
Too long has the criminal been a subject of public indifference. So that he is caught and punished the majority care little what becomes of him afterward. Again, the fact is overlooked that our system of society is too often the cause of criminality; that we ourselves create the offender and then punish him for offending, and being in whole or in part responsible, that many of its members are ignorant and some sinful, society may well lend its aid first toward remedying these conditions, and second, toward substituting reforma-

tion and reclamation for punishment. "Men who sin through ignorance are better lifted from their sins than by being forced to expiate them."

A most significant change in the treatment of the criminal has been made in recent years by the introduction of the indeterminate sentence system in several of the states. This puts it in the power of men who may have been harshly judged in the first place and whose mere conviction was penalty enough, to earn their freedom. The hope of liberty is in itself a stimulus to effort at right-doing in the reformatory that is not generally appreciated in those states that have not yet tried the indeterminate method of sentence. Schools and training classes are established and the man reprov'd of the law goes back into the world stronger than when he left it. In addition to the parole or indeterminate sentence, Massachusetts has adopted a probationary system which goes into operation before sentence. Certain men and women attend trials in the lower courts and act as intercessors in cases that promise reform. The probation officer is the opposite of the prosecuting attorney in that the latter brings up everything that is bad against the prisoner while it is the duty of the probation officer to find all that is good. It is no longer necessary to confine a man even if he is guilty; he can be placed on parole instead. These probation officers can, with the consent of a paroled man, collect his wages and give them to his family. He then has no power to buy drink or squander his means, and if he misbehaves in any wise his liberty is the forfeit and he can be sent to prison. That the warning of an initial arrest suffices in a majority of cases is proved by the records, for few of the paroled ever imperil their liberty again, and something like 4,000 persons are conditionally released in the state of Massachusetts every year. The criminal is almost invariably weak of will, mind or body. He does not understand himself or his relation to society. His ideals are wrong. His passions have never known check and he is deficient in education. In this state of semi-barbarism he is dangerous and society itself primarily responsible for his condition, sends him into confinement for its own self protection. If it does no more he returns at the end of his sentence worse than when he went in. When it opens his cell door it must open the way to a better life. Until the mind and conscience are awakened there can be no true penitence; only anger and nursing of revenge. Mere punishment consigns the victim to darkness and hopelessness; but the probation officer, the reformatory, enlightened and humane treatment bring him to the light.

Nor can it be maintained that society's duty only begins with the prisoner's term of sentence. Poverty and ignorance are the chiefly prolific parents of crime and bad environment and lack of opportunity in righteous paths are its foster parents. If poverty and ignorance can be abolished; if these are remediable evils, then the system of society which allows them to exist is criminally responsible for their existence. Poverty that is avoidable is criminal. If a system of society is possible that will abolish poverty and ignorance, then we who support and maintain any other system are morally responsible for the crimes which the system engenders; and if crime can be abolished by a change of system, then let us advocate a change and free ourselves from this monstrous charge.

Another thought in this connection: To-day there is absolutely no person in this State charged with the duty of looking out for the welfare of the discharged convicts. His term of sentence having expired he is given a suit of clothes, a ticket to return to the place from which he was sentenced and a few dollars handed him by the warden. He is then free to go, but who is there to extend him a friendly bit of advice, to speak an encouraging word, to see that the discharged man does not at once fall into dissolute company simply because there is absolutely no other with which he can mingle. There are 72 persons now in Deer Lodge who have been in prison before. It is not improbable that some of these might have been induced to lead honest and upright lives after serving their first term if they had been properly looked after at the time of their former discharge. Has the State performed its whole duty when it locks a man in prison for a term of years and simply turns him loose when that term is completed? It may be years before the incentive to crime, and the system which fosters it, will be changed; but it is not unreasonable to suppose that the suggestions here given will do much toward remedying present conditions and discharge the very apparent duty of the State towards its criminal classes.



STATE PENITENTIARY AT DEER LODGE.

RESULTS OF A SOCIOLOGICAL INVESTIGATION MADE UP

OCCUPATION	Age	Religion	Attendance at Sunday School to Age of	Use of Liquor	Use of Tobacco	EDUCATION		Raised in City, Town or Country
						Years Attendance at School	Age When Stopped School	
Amalgamator	51			Yes....	No....	12	22	City
Baker	40		8	No....	Chew.	4	11	City
Baker	42	Lutheran	10	Yes....	Yes....	10	18	Country
Baker	26	Catholic	7	No....	No....	8	16	Country
Baker, Cook and Confect'r ..	27	Catholic	7	Yes....	Smoke	7	16	Town
Barber	40			Yes....	Smoke	5	12	Country
Barber	27	Baptist		Yes....	Smoke	6	14	Town
Barber	48	Catholic		No....	Smoke	5	17	Town
Barber	26		6	Yes....	Yes....	4	14	Country
Barber	29			Yes....	Smoke	7	13	City
Barber	25	Catholic		Yes....	C. & S	7	16	City
Bartender	40	Methodist	6	Yes....	Yes....	12	18	Country
Bartender	33	Lutheran	7	Yes....	Smoke	4	10	Town
Bartender and Cook	41			Yes....	Chew.	4	11	Town
Baseball player	24	Methodist	7	Yes....	Smoke	8	16	Town
Blacksmith	61	Catholic	8	Yes....	C. & S	3	10	Country
Blacksmith	35			Yes....	Yes....	11	16	City
Blacksmith	30		10	Yes....	Yes....	4	10	City
Blacksmith	27	Lutheran	6	Yes....	Yes....	8	17	Country
Blacksmith and Shoemaker ..	46			Yes....	No....	7	16	Town
Boilermaker	36	Catholic	8	Yes....	Chew.	5	14	Town
Boilermaker	30	Baptist	7	Yes....	Smoke	7	19	City
Boilermaker and Sailor	52	Episcopal		Yes....	Chew.	7	17	Country
Boilermaker's Apprentice	18	Catholic	9	Yes....	Yes....		14	City
Bookkeeper	29	Presbyter'n	9	Yes....	Smoke	7	13	Town
Bootblack	21			Yes....	Smoke	3	9	City
Bricklayer	28	Catholic		Yes....	Smoke	7	16	Town
Butcher	47	Atheist	19	Yes....	Yes....	3	10	Country
Butcher	39	Presbyter'n	7	No....	No....	6	12	Town
Butcher	36	Christian	22	Yes....	Yes....			Country
Butcher	36	Methodist	7	No....	Smoke	6	13	Country
Butcher	21	Catholic		Yes....	Smoke	8	17	Country
Butcher	25	Catholic	7	Yes....	No....	8	17	Town
Butcher	38		17	Yes....	Yes....		18	Town
Butcher	31			Yes....	No....	3	13	City
Butcher	31			Yes....	No....	3	13	City
Butcher and Engineer	50			No....	C. & S	8	15	City
Candymaker	32	Presbyter'n	8	Yes....	C. & S	7	13	City
Carpenter	24			Yes....	Yes....	5	16	Town
Carpenter	22	Protestant	16	Yes....	Yes....	5	13	Country
Carpenter	35			No....	Yes....		13	City
Carpenter	51			Yes....	Smoke	4	10	Town
Carpenter	30	Catholic	8	Yes....	C. & S	8	15	Town
Chiropodist	36		7	Yes....	C. & S	8	16	Town
Clerk	34			No....	Chew.	8	13	Country
Clerk	51	Episcopal	7	No....	Chew.	8	16	Town
Clerk	24	Methodist	7	Yes....	Smoke	4	11	City
Clerk	28	Indifferent	18	Yes....	Smoke	6	21	City
Clerk and Stenographer	37	Methodist	8	No....	Smoke	13	21	City
Clerk	24	Catholic	9					
Coachman and Showman	27	Baptist		Yes....	Smoke	4	11	City
Cook	33	Methodist	7	Yes....	Chew.	9	17	City
Cook	44			No....	Smoke	7	15	Country
Cook	31	Presbyter'n	8	Yes....	No....	7	16	Country
Cook	31			Yes....	Yes....	1		Town
Cook	44	Catholic	7	No....	Smoke	6	13	Town
Cook	40			Yes....	Smoke	6	12	Town
Cook	32			Yes....	Smoke	6	17	Town
Cook	38	Methodist	7	Yes....	Yes....	8	17	Country

FROM 369 CONVICTS IN THE STATE PENITENTIARY.

NATIVITY		Served Prison or Jail Sentence Before,	Politics	Crime of Which Convicted	Term of Sentence— Years.....
Country	State in Which Born, if Born in United States				
United States	Tennessee	No....	Dem...	Rape	5
.....	Ohio	No....	Rep...	Assault ..	5
German .....	.....	Yes....	Dem...	Burglary	2
German .....	.....	No....	None..	Forgery	1½
.....	Ala. (Col'r).....	No....	None..	Murder 2nd	28
.....	Virginia	Yes....	Rep...	Assault 1st	7
.....	Penn. (Col'r)	Yes....	Dem...	Robbery	10
.....	Iowa	No....	Dem...	Assault 2nd	5
.....	Penn.	No....	None..	Forgery	2
.....	Oregon	Yes....	None..	Robbery	15
.....	New York	No....	None..	Grand Larceny	1
England .....	.....	No....	Rep...	Rec'd Stolen Property	2
Sweden .....	.....	No....	Rep...	Manslaughter	6
.....	Illinois	No....	Dem...	Murder 2nd ..	25
.....	Iowa	No....	None..	Burglary 1st	5
Irish .....	.....	No....	Rep...	Murder 2nd	Life.
.....	Wisconsin	No....	Rep...	Sodomy	7½
Italian .....	.....	No....	Dem...	Assault 1st	7
Norway .....	.....	No....	Dem...	Grand Larceny ..	1½
.....	Illinois	No....	None..	Attempted rape	15
.....	Wisconsin	No....	Rep...	Burglary 1st ..	2
.....	New York	No....	None..	Robbery	12
England .....	.....	No....	None..	Mayhem	2½
.....	Michigan	No....	Pop...	Manslaughter ..	6
Canada .....	.....	No....	Dem...	Forgery	2¾
.....	Illinois	Yes....	None..	Burglary ..	5
Scotland .....	.....	No....	Dem...	Grand Larceny ..	2
.....	Maine	Yes....	Nihil..	Rape	6
.....	Iowa	No....	None..	Grand Larceny ..	3
.....	California	No....	None..	Grand Larceny	2
.....	California	No....	None..	Grand Larceny	2
German .....	.....	No....	None..	Grand Larceny	5
German .....	.....	No....	None..	Assault 2nd	3
.....	Iowa	No....	Dem...	Grand Larceny	3
Canada .....	.....	No....	Rep...	Grand Larceny	9
Canada .....	.....	No....	Rep...	Grand Larceny	9
German .....	.....	No....	Rep...	Vol. manslaughter	10
.....	Mass.	Yes....	None..	Burglary 1st	7
.....	New Jersey	No....	Rep...	Manslaughter ..	2
.....	Missouri	No....	Dem...	Manslaughter ..	5
.....	New York	No....	None..	Manslaughter	10
Canada .....	.....	No....	None..	Rape	20
Canada .....	.....	Yes....	None..	Assault 1st	5
.....	Alabama	Yes....	None..	Grand Larceny ..	12
.....	New York	No....	Rep...	Rape	13
England .....	.....	No....	None..	Forgery	2
.....	Mass	No....	None..	Murder 2nd	Life.
.....	Louisiana	No....	Rep...	Opening mail	1
.....	New York	No....	Rep...	Forgery	5
.....	Illinois .....	.....	.....	Grand Larceny	1
.....	N. Y. (Col'r)	Yes....	None..	Grand Larceny ..	10
.....	New York	No....	None..	Burglary ..	1
United States .....	.....	No....	None..	Murder 2nd	10
England .....	.....	No....	None..	Grand Larceny ..	2
England .....	.....	No....	None..	Grand Larceny ..	2
French .....	.....	No....	None..	Incest	10
Scotch .....	.....	No....	None..	Forgery	5
.....	Illinois	Yes....	Dem...	Burglary	4
.....	Kentucky	No....	Dem...	Buggery	5

RESULTS OF A SOCIOLOGICAL INVESTIGATION MADE UP

OCCUPATION	Age	Religion	Attendance at Sunday School to Age of	Use of Liquor	Use of Tobacco	EDUCATION		Raised in City, Town or Country
						Years Attendance at School	Age When Stopped School	
Cook	48	Catholic ..	12	No....	Yes....		16	Country
Cook	33	Catholic ..	14	Yes....	Yes....		14	City
Cook	28	.....		No....	C. & S	4	11	Town
Cook	30	Methodist ..	6	Yes....	Yes....	10	17	City
Cook	49	Methodist ..		No....	Smoke			Country
Cook	52	.....	15	Yes....	Yes....	4	14	City
Cook and Waiter and Barber	35	.....		Yes....	C. & S	6	12	City
Cook and Rancher	37	Presbyter'n	9	No....	No....	12	19	Town
Cooper	36	Catholic ..	7	Yes....	Yes....	11	17	City
Cooper	37	.....		Yes....	C. & S	4	11	Town
Cotton Miller	31	.....	16	Yes....	Yes....		13	City
Cowboy	29	Episcopal ..	8	Yes....	Chew .	3	10	Town
Cowboy	46	.....	15	No....	No....	5	20	Country
Cowboy	32	Catholic ..	6	Yes....	Yes....	6	7	Country
Cowboy	37	.....		Yes....	Chew .	7	15	Town
Cowboy	22	Protestant		Yes....	Yes....	6	16	Country
Cowboy	43	.....		Yes....	Smoke	8	16	Country
Cowboy	35	Methodist ..		Yes....	C. & S			Town
Cowboy	34	.....		Yes....	Smoke	4	10	City
Cowboy	32	.....		Yes....	No....	7	16	Country
Cowboy	37	.....	7	Yes....	Yes....	3	16	Country
Cowboy	25	Methodist ..	8	Yes....	No....	5	13	City
Cowboy	32	.....		Yes....	Smoke	3	9	City
Cowboy	25	Catholic ..		Yes....	Smoke			Country
Cowboy	25	.....		Yes....	Smoke	8	16	Town
Cowboy	26	.....		Yes....	Yes....	5	12	Country
Cowboy	39	.....		Yes....	C. & S	12	19	Town
Cowboy and Stockman	19	.....		No....	Smoke	7	16	Country
Cowboy and Ranchman	32	Methodist ..	7	Yes....	No....	8	18	Town
Cowboy	25	Catholic ..		No....	No....			Country
Demimonde	30	Methodist ..	13	No....	No....	2	12	City
Demimonde	19	Baptist ..	13	Yes....	Yes....	7	13	Town
Dressmaker	24	Catholic ?	12	Yes....	Yes....	4	12	Town
Electrician	34	Presbyter'n	20	Yes....	Yes....		16	City
Electrician	34	Presbyter'n	7	Yes....	Chew	8	22	City
Electrician	34	Methodist ..	8	No....	No....	14	21	Town
Engineer	41	Protestant	18	Yes....	Yes....	6	13	Country
Engineer	25	Baptist ..	8	Yes....	No....	8	16	City
Engineer	28	.....		Yes....	Smoke			City
Engineer	51	.....		Yes....	C. & S	4	11	Country
Engineer	35	.....		Yes....	Smoke	7	13	City
Engineer	42	.....		Yes....	Yes....			Country
Engineer	33	Presbyter'n	7	Yes....	C. & S	8	20	City
Engineer	33	Catholic ..	10	Yes....	Yes....			City
Fireman	43	.....		Yes....	Yes....	8	16	City
Fireman	22	.....		Yes....	No....	6	13	Town
Fireman	28	Protestant		Yes....	Yes....	3	10	Country
Fireman	41	Episcopal ..	8	Yes....	C. & S	8	16	Town
Foundryman	33	Catholic ..	7	No....	Smoke	6	12	City
Gambler	46	Deist ..	16	Yes....	Yes....	10	16	City
Gambler	39	Presbyter'n	8	Yes....	Smoke	7	14	Town
Gambler	50	.....		Yes....	Smoke	12	19	Town
Gardener	56	Catholic ..	7	Yes....	Yes....	7	14	City
Groceryman	50	Catholic ..		Yes....	C. & S	8	17	City
Harness-maker	54	.....		Yes....	Smoke	7	15	Country
Harness-maker	34	.....		No....	No....	6	22	Town
Horseman	55	Presbyter'n	17	Yes....	No....		17	Country
Horseman	31	Methodist ..	6	No....	Chew			Country

FROM 369 CONVICTS IN THE STATE PENITENTIARY.—Continued

NATIVITY		Served Prison or Jail Sentence Before	Politics	Crime of Which Convicted	Term of Sentence— Years
Country	State in Which Born, if Born in United States				
.....	Kentucky	No....	Dem...	Grand Larceny	6
.....	Michigan	No....	Dem...	Grand Larceny	1
.....	Michigan	No....	Dem...	Forgery	3
.....	Arizona	No....	Rep...	Burglary	2
.....	Kentucky	No....	Rep...	Grand Larceny	6
.....	New York	No....	Social.	Murder 2nd	11
.....	Michigan	No....	.....	Burglary	5
.....	Michigan	No....	Rep...	Buggery	10
England .....	.....	No....	Dem...	Burglary 1st	1½
.....	Illinois	Yes....	None..	Robbery	1½
England .....	.....	No....	Rep...	Burglary 2nd	½
.....	Ohio	No....	Rep...	Assault 2nd	3
.....	Texas	No....	Rep...	Murder 2nd	22
.....	New York	No....	Rep...	Assault 1st	5
.....	Arkansas	Yes....	Dem...	Assault 2nd	5
.....	Texas	No....	Dem...	Grand Larceny	1
.....	Ohio	No....	Dem...	Murder 2nd	Life.
.....	Minnesota	Yes....	Dem...	Burglary 2nd	10
.....	Illinois	No....	Rep...	Assault 1st	5
.....	Colorado	Yes....	Rep...	Assault 2nd	5
.....	Arkansas	No....	Dem...	Assault 2nd	5
.....	Penn.....	No....	None..	Rape	5
.....	New York	No....	None..	Assault 1st	5
Mexican .....	.....	No....	None..	Manslaughter	10
.....	Iowa (Col'r)	No....	None..	Murder 2nd	30
.....	Kansas	Yes....	None..	Grand Larceny	4
.....	Kentucky	No....	None..	Grand Larceny	14
.....	Montana	Yes....	None..	Grand Larceny	1
.....	California	No....	None..	Grand Larceny	14
½ Indian .....	.....	No....	None..	Forgery	2½
.....	Michigan	No....	None..	Assault 2nd	2
.....	Iowa	No....	None..	Murder 2nd	20
.....	New York .....	.....	None..	Grand Larceny	1½
.....	Michigan	No....	Rep...	Burglary 1st	10
.....	Michigan	No....	Dem...	Burglary 1st	10
.....	S. Dakota	No....	None..	Bigamy	3
.....	Iowa	No....	Rep...	Manslaughter	10
.....	Penn.....	No....	Rep...	Manslaughter	10
.....	Mass.....	No....	Rep...	Abortion	5
.....	Kentucky	No....	Dem...	Grand Larceny	5
.....	.....	No....	None..	Murder 2nd	Life.
.....	Vermont	No....	None..	Rape	14
.....	Penn.....	No....	None..	Grand Larceny	4
.....	Penn.....	Yes....	None..	Grand Larceny	4
.....	Mass.....	Yes....	Rep...	Forgery	1
.....	Illinois	No....	None..	Buggery	15
Canada .....	.....	No....	None..	Forgery	1
England .....	.....	No....	None..	Murder 2nd	Life.
German .....	.....	No....	Rep...	Grand Larceny	14
.....	Wisconsin	No....	Rep...	Assault to rob	10
.....	Kansas	No....	Rep...	Murder 2nd	Life.
.....	California	No....	Rep...	Manslaughter	10
French .....	.....	No....	None..	Grand Larceny	1½
.....	Wisconsin	No....	Rep...	Forgery	3
Irish .....	.....	Yes....	Rep...	Robbery	31
Italy .....	.....	No....	None..	Vol. Manslaughter	10
.....	New York	No....	Dem...	Assault, intent to kill	12
.....	W. Virginia	No....	None..	Grand Larceny	4

EIGHTH BIENNIAL REPORT OF BUREAU

RESULTS OF A SOCIOLOGICAL INVESTIGATION MADE UP

OCCUPATION	Age	Religion	Attendance at Sunday School to Age of	Use of Tobacco	Use of Liquor	EDUCATION		Raised in City, Town or Country
						Years Attended at School	Age When Stopped School	
Hospital Steward, Ass't	56	Lutheran	6	Yes	Chew	7	20	Country
Jockey	19	Catholic	8	No	Smoke			City
Laborer	20	Methodist	7	No	No	7	13	Town
Laborer	25			Yes	Yes	4	13	City
Laborer	19	Catholic	7	Yes	Yes	8	14	City
Laborer	23	Methodist		Yes	No	7	16	Country
Laborer	24	Methodist		No	No	8	14	Town
Laborer	23	Catholic	8	Yes	Smoke	8	15	City
Laborer	31			Yes	C. & S	7	15	City
Laborer	26	Salv'n Army	7	Yes	Yes	6	15	City
Laborer	22	Catholic	7	Yes	No	8	17	Country
Laborer	21		6	No	No	2	14	Country
Laborer	53			No	Smoke	4	16	Country
Laborer	29	Catholic		Yes	Smoke	5	13	Town
Laborer	46	Catholic		Yes	Yes			Town
Laborer	50	Catholic		No	No	7	18	Town
Laborer	37	Catholic		Yes	Smoke			Town
Laborer	28			No	Smoke	6	12	Town
Laborer	47	Baptist	6	Yes	Chew	6	14	Town
Laborer	26			Yes	Smoke	8	13	Town
Laborer	25	Presbyter'n	7	No	No	8	18	City
Laborer	33			Yes	Smoke	7	19	Town
Laborer	38	Methodist	7	Yes	Smoke	7	13	City
Laborer	25			Yes	C. & S	3	10	Town
Laborer	21	Methodist	7	No	No	6	12	Town
Laborer	20			Yes	C. & S	3	9	City
Laborer	19	Catholic	6	No	Yes	8	14	Town
Laborer	22			Yes	Chew	4	10	City
Laborer	29			Yes	Chew	4	10	City
Laborer	37			Yes	Smoke			City
Laborer	20	Methodist		No	Smoke	6	13	City
Laborer	26			No	Chew	4	10	City
Laborer	24	Methodist		No	No	12	18	Town
Laborer	45			No	Smoke	8	19	Town
Laborer	22			No	No			
Laborer	20	Catholic	7	Yes	Smoke	7	16	Country
Laborer	18	Methodist	7	No	No	7	13	Town
Laborer	60	Lutheran		No	Chew	7	18	Country
Laborer	32			Yes	Smoke	6	12	Town
Laborer	22	Lutheran		Yes	Smoke	4	13	Country
Laborer	21	Catholic	7	No	No	7	16	Country
Laborer	21			Yes	C. & S			Town
Laborer	54			Yes	Smoke	4	16	Town
Laborer	38	Salv'n Army	6	Yes	Smoke			Country
Laborer	31	Lutheran		Yes	Smoke	3	10	Country
Laborer	41	Lutheran		No	Yes			Country
Laborer	34	Catholic		Yes	No	7	16	Town
Laborer	21			Yes	Yes	1	15	Town
Laborer	29	Methodist	7	Yes	Chew	4	11	Town
Laborer	42	Catholic		Yes	Smoke	8	15	Country
Laborer	50			Yes	C. & S	5	13	Town
Laborer	40	Christian	7	No	C. & S	6	13	Country
Laborer	36			Yes	Smoke	6	17	City
Laborer	11	Methodist	7	No	Chew	4	12	Country
Laborer	45	Lutheran		No	No	7	19	Town
Laborer	28	Catholic		Yes	No	8	15	Town
Laborer	43	Catholic		Yes	C. & S	4	9	City
Laborer	50	Catholic	6	Yes	C. & S	4	10	Town

FROM 369 CONVICTS IN THE STATE PENITENTIARY.—Continued

NATIVITY		Served Prison or Jail Sentence Before	Politics	Crime of Which Convicted	Term of Sentence—Years
Country	State in Which Born, if Born in United States				
Sweden	Illinois	No....	None..	Murder 2nd	11
	Missouri	No....	None..	Grand Larceny	1
		No....	None..	Burglary 2nd	5
	Minnesota	No....	None..	Burglary	1
	Minnesota	No....	None..	Burglary	1
	Minnesota	No....	None..	Forgery	3
	Minnesota	No....	None..	Grand Larceny	6
	Michigan	No....	None..	Robbery	5
	Mass.	Yes....	None..	Robbery ..	17
	Mass.	No....	None..	Burglary	1
	Iowa	No....	None..	Rape	5
	Iowa	No....	None..	Forgery	3
	Indiana	No....	None..	Kidnapping	25
Ireland		No....	None..	Robbery	17
Ireland		No....	None..	Murder 2nd	Life.
Italian		No....	None..	Assault 1st	10
Italian		No....	None..	Murder 2nd	Life.
	Wisconsin	No....	None..	Burglary	1½
	Virginia	No....	None..	Murder 2nd	Life.
	Tennessee	Yes....	None..	Assault 2nd	4
	Penn.	No....	None..	Murder 2nd ..	20
	Penn.	Yes....	None..	Robbery	18
	Ohio	Yes....	None..	Robbery	20
	Ohio	No....	None..	Burglary	2
	Ohio	No....	None..	Perjury	6
	Ohio	Yes....	None..	Burglary	1
	Ohio	No....	None..	Burglary	1
	New York	Yes....	None..	Assault 1st	6
	New York	No....	None..	Forgery	2
	New York	Yes....	None..	Robbery	20
	New York	No....	None..	Burglary	1
	New York	No....	None..	Assault 2nd	5
	Nebraska		None..	Manslaughter	10
Canada		No....	None..	Murder 1st	Life.
Japan		No....	None..	Assault 1st	1
German		No....	None..	Forgery	5
German		No....	None..	Murder 2nd	Life.
Finlander		No....	None..	Buggery	5
Sweden		No....	None..	Robbery	1
Norway		No....	None..	Grand Larceny	2
Scotch		No....	None..	Burglary 2nd	1½
	Montana	Yes....	None..	Burglary	3
Canada		Yes....	Rep...	Murder 2nd....	Life.
Austria		No....	Rep...	Murder 2nd	25
Finland			Rep...	Arson	5
Sweden			Rep...	Rape	15
Scotland		No....	Rep...	Burglary	1
	Montana	No....	Rep...	Burglary 2nd	3
	Michigan	No....	Rep...	Manslaughter ..	5
Irish		Yes....	Rep...	Grand Larceny	3
	Tennessee	No....	Rep...	Murder 2nd	35
	Penn	Yes....	Rep...	Robbery	20
	New York	Yes....	Rep...	Burglary 1st	15
	S. Dakota	No....	Dem..	Burglary	2
	Penn.	No....	Dem..	Incest	10
	Penn.	No....	Dem..	Burglary	2
	New York	No....	Dem..	Rape	12
..French		No....	Dem..	Murder 2nd ..	Life.

RESULTS OF A SOCIOLOGICAL INVESTIGATION MADE UP

OCCUPATION	Age	Religion	Attendance at Sunday School to Age of	Use of Liquor	Use of Tobacco	EDUCATION		Raised in City, Town or Country
						Years Attended at School	Age When Stopped School	
Laborer	34		10	Yes	Yes	4	10	Town
Laborer	24	Methodist		Yes	Smoke	12	20	Town
Laborer	38	Baptist	13	Yes	Yes	1	14	Country
Laborer	25	Presbyter'n	7	Yes	C. & S	4	11	Town
Laborer	42	Catholic	6	Yes	Yes	18	21	City
Laborer	52		10	Yes	Yes	5	25	Country
Laborer	49			No	C. & S			Town
Laborer	49			Yes	Smoke			City
Laborer	34			Yes	C. & S			City
Lapidary	32	Episcopal		Yes	Smoke	7	16	City
Laundryman	27			Yes	Smoke	7	14	Town
Liveryman	39		9	Yes	Yes		17	City
Longshoreman	56	Protestant	7	No	No	8	17	Country
Lumberman	29			Yes	C. & S			Town
Lumberman	37	Christian	7	No	C. & S	5	13	Country
Machinist	53	Presbyter'n	8	Yes	C. & S	12	19	City
Machinist	47	Christian		Yes	Smoke	5	12	City
Machinist and Blacksmith	49	Lutheran	7	Yes	Yes	9	15	Country
Machinist	34			No	Smoke	11	21	Town
Machinist	20		7	Yes	C. & S	8	13	Town
Machine hand	19			Yes	Smoke	6	16	City
Mason	35	Catholic	6	Yes	Yes	6	10	City
Miller	48			Yes	Smoke	9	19	Town
Miner	52	Presbyter'n	7	No	Smoke	3	10	Town
Miner	28	Lutheran	8	No	No	5	15	Country
Miner	27			Yes	C. & S	9	16	Town
Miner	33			Yes	C. & S	5	17	Town
Miner	31			Yes	Smoke	7	16	City
Miner	34			No	Smoke	6	15	Town
Miner	49	Presbyter'n	6	No	Smoke	3	10	Town
Miner	25	Presbyter'n	7	No	No	8	16	Country
Miner	34	Catholic		Yes	C. & S	12	19	Country
Miner	51	Catholic		No	Smoke	9	16	Town
Miner	19	Catholic	7	Yes	Smoke	8	14	City
Miner	26							
Miner	38	Episcopal	16	No	No	11	15	Country
Miner	41	Episcopal	18	No	Yes	12	18	Town
Miner	76			No	No	4	12	Country
Miner	49			Yes	Smoke	4	10	Town
Miner	50			Yes	Chew			City
Miner	32	Methodist		Yes	Chew	5	16	Country
Miner	26		8	No	Chew	8	14	Town
Miner	42	Catholic		Yes	C. & S	12	20	Country
Miner	48			Yes	Chew	7	14	Country
Miner	48		6	Yes	Yes	8	14	Country
Miner	41	Episcopal	8	No	Chew	5	16	Country
Miner	50	Episcopal		No	Smoke	7	17	Town
Miner	52	Episcopal	7	Yes	C. & S	7	14	Town
Miner	41	Methodist	7	Yes	Smoke	4	11	Town
Miner	28	Lutheran	16	Yes	Yes	10	18	Country
Miner	26	Protestant	16	Yes	Yes	8	16	Country
Miner	72		14	Yes	Yes	5	13	Country
Miner	29	Catholic	6	Yes	Yes	7	16	City
Miner	24			Yes	Smoke	8	16	Country
Miner	27			Yes	C. & S	8	15	City
Miner	34			Yes	C. & S	12	28	Country
Miner	53	Catholic		Yes	Chew	7	15	Country
Miner	37	Catholic	14	Yes	Yes	4	12	City
Miner	50	Protestant	6	No	No	4	10	Town
Miner	49	Lutheran	8	Yes	Smoke	5	12	Country

FROM 369 CONVICTS IN THE STATE PENITENTIARY.—Continued

NATIVITY		Served Prison or Jail Sentence Before.....	Politics	Crime of Which Convicted	Term of Sentence— Years
Country	State in Which Born, if Born in United States				
Austria .....	.....	No....	Dem...	Manslaughter	2
.....	Mass.....	No....	Dem...	Assault 1st	9
.....	Maryland	Yes...	Dem...	Forgery	4
.....	Iowa	Yes...	Dem...	Burglary	5
Ireland .....	.....	No....	Dem...	Grand Larceny	3
.....	.....	No....	Dem...	Burglary ..	1
French Canadian .....	.....	Yes...	Dem...	Robbery	12
Canada .....	.....	Yes...	None..	Robbery	15
.....	.....	Yes...	None..	Robbery	12
England .....	.....	No....	None..	Murder 2nd	Life.
.....	Missouri	Yes...	None..	Robbery	8
Scotch Irish .....	.....	No....	Dem...	Robbing mail	1
England .....	.....	No....	None..	Rape	45
.....	Michigan	Yes...	None..	Robbery	2
Canada .....	.....	No....	None..	Bigamy	3
.....	New York	Yes...	Dem...	Burglary 1st	13
.....	New York	Yes...	Dem...	Grand Larceny ..	7
Sweden .....	.....	No....	Dem...	Grand Larceny ..	4
Norway .....	.....	No....	None..	Robbery	40
.....	Arkansas	Yes...	None..	Robbery	15
.....	Michigan	No....	None..	Burglary attempt ..	1
Winnebago Res.....	.....	No....	Rep...	Murder	Life.
.....	Texas	No....	Dem...	Manslaughter	5
German .....	.....	No....	None..	Rape	25
Sweden .....	.....	No....	None..	Grand Larceny ..	1
.....	Tennessee	Yes...	None..	Robbery	15
.....	Penn	Yes...	None..	Assault 2nd	10
.....	New York	Yes...	None..	Burglary 1st	5
.....	Nebraska	No....	None..	Murder 2nd	Life.
.....	Michigan	No....	None..	Murder 2nd	40
.....	Minnesota .....	.....	None..	Burglary	1
Irish .....	.....	Yes...	None..	Robbery	20
Irish .....	.....	No....	None..	Murder 2nd	Life.
Irish .....	.....	No....	None..	Burglary	5
Italy .....	.....	.....	.....	Burglary	1½
England .....	.....	No....	Pop...	Grand Larceny	1
England .....	.....	No....	Pop...	Grand Larceny	2
.....	Ohio	No....	Rep...	Manslaughter	10
.....	New York	No....	Rep...	Rape	15
.....	New York	Yes...	Rep...	Grand Larceny	2
.....	Michigan	No....	Rep...	Invol. Manslaughter..	5
.....	Colorado	No....	Rep...	Grand Larceny	5
Irish .....	.....	No....	Rep...	Grand Larceny	11
Canada .....	.....	No....	Rep...	Assault 1st ..	6
Canada .....	.....	No....	Rep...	Assault 1st ..	6
England .....	.....	No....	Rep...	Grand Larceny	2
England .....	.....	No....	Rep...	Murder 2nd	25
England .....	.....	No....	Rep...	Murder 2nd	Life.
England .....	.....	No....	Rep...	Murder 2nd	60
Sweden .....	.....	No....	Rep...	Grand Larceny ..	1
Finland .....	.....	No....	Dem...	Assault 2nd	2½
.....	Vermont	No....	Dem...	Murder 2nd	15
.....	Penn.....	No....	Dem...	Burglary	2
.....	Penn.....	Yes...	Dem...	Robbery	18
.....	Michigan	No....	Dem...	Burglary	8
Ireland .....	.....	No....	Dem...	Murder	17
Ireland .....	.....	No....	Dem...	Assault 1st	10
Italian .....	.....	No....	Dem...	Assault 1st	7
England .....	.....	No....	None..	Grand Larceny	2
Austria .....	.....	No....	None..	Murder 2nd	Life.

RESULTS OF A SOCIOLOGICAL INVESTIGATION MADE UP

OCCUPATION	Age	Religion	Attendance at Sunday School to Age of	Use of Liquor	Use of Tobacco	EDUCATION		Raised in City, Town or Country
						Years Attended School	Age When Stopped School	
Miner	40			No....	C. & S	4	12	City
Miner	43	Catholic		No....	Smoke	9	16	Country
Musician	32	Catholic		Yes....	Chew			City
Painter	40	Presbyter'n	14	No....	No....	12	21	City
Painter	29			Yes....	Yes....	1	8	Town
Painter	20		6	No....	Yes....	8	14	City
Painter	22	Catholic	9	No....	C. & S	7	16	Town
Painter	32	Catholic		Yes....	Smoke	7	15	Town
Painter	34			Yes....	Smoke	16	20	City
Painter and Shoemaker	40	Baptist	7	Yes....	Chew	4	10	City
Painter and Tailor	41	Catholic	6	Yes....	Smoke	4	11	Town
Painter and Cook	47	Methodist		No....	No....			Country
Paperhanger	41			Yes....	No....	4	10	City
Photographer ..	41			Yes....	Smoke	8	14	Town
Plasterer	39	Presbyter'n	7	No....	Smoke	8	17	City
Plumber	20	Catholic	9	No....	Smoke	6	13	City
Plumber	21	Methodist	6	Yes....	C. & S			City
Railroadman ..	56	Catholic	7	Yes....	Smoke	6	12	Country
Railroadman ..	26			Yes....	Smoke	5	13	Town
Railroadman ..	42	Catholic		Yes....	Smoke	3	12	Country
Railroadman ..	44		6	Yes....	Yes....	8	15	City
Railroadman ..	30	Methodist		Yes....	C. & S	6	13	Country
Railroadman ..	38			Yes....	No....	12	20	City
Railroadman ..	38			Yes....	C. & S	7	16	City
Railroadman ..	34	Catholic		Yes....	Smoke	8	16	Town
Railroadman ..	31			Yes....	C. & S	7	16	City
Real Estate Agent	39	Catholic	14	Yes....	Yes....	12	18	Town
Real Estate Agent	38	Methodist	8	No....	No....	10	19	City
Real Estate Agent	50	Presbyter'n	8	No....	Smoke	12	21	City
Rancher	28		9	Yes....	Yes....	8	10	Country
Rancher	43	Episcopal	8	Yes....	C. & S			
Rancher	23			Yes....	Smoke	6	15	Country
Rancher	47	Catholic	7	No....	Yes....	5	15	Country
Rancher	29	Salvationist	6	No....	Chew	7	16	City
Rancher	35	Methodist	6	No....	Chew	8	17	Country
Rancher	29	Protestant	18	No....	Yes....	9	15	City
Rancher	52	Catholic		No....	Yes....			City
Rancher	38	Catholic	10	Yes....	Yes....	2	12	Country
Rancher	54			No....	Yes....			Country
Rancher	36	Protestant		Yes....	Yes....			Country
Rancher	41			Yes....	No....	3	9	Town
Rancher	31		16	Yes....	Yes....			Country
Rancher	24		6	Yes....	Yes....	12	18	Country
Rancher	34	Catholic	8	Yes....	C. & S	7	15	Country
Rancher	19		6	Yes....	Yes....	6	15	
Rancher	24			Yes....	Yes....	15	20	City
Rancher	26	Presbyter'n	8	Yes....	C. & S	3	10	Town
Rancher	28	Catholic	7	Yes....	Yes....	11	15	City
Rancher	36	Catholic	18	Yes....	Yes....	8	16	Country
Rancher	33	Protestant	6	Yes....	Yes....	3	12	Country
Rancher	39	Episcopal	8	Yes....	Smoke	7	15	Town
Rancher	42		13	Yes....	Yes....			Country
Rancher	20	Lutheran	10	No....	No....	9	15	City
Rancher	50	Lutheran		No....	No....	3	12	Town
Rancher	30			Yes....	C. & S	7	13	Town
Rancher	45		7	No....	Smoke	3	13	Country
Rancher	40	Catholic	6	Yes....	Yes....	6	12	Country
Rancher	41	Mormon		No....	C. & S	12	19	Town
Rancher	63			Yes....	Smoke			City

FROM 369 CONVICTS IN THE STATE PENITENTIARY.—Continued

NATIVITY		Served Prison or Jail Sentence Before.....	Politics	Crime of Which Convicted	Term of Sentence— Years.....
Country	State in Which Born, if Born in United States				
Austria .....	.....	No....	None..	Murder 2nd	Life..
German .....	.....	No....	None..	Murder 2nd	Life..
.....	Tenn (Col'r)	Yes....	None..	Burglary 1st	4
England .....	.....	No....	None..	Rape	Life..
.....	Indiana	No....	None..	Robbery	1
.....	Wisconsin	No....	None..	Burglary	1½
.....	Illinois	No....	Dem... Rep...	Burglary 2nd	5
South Am. ....	.....	Yes....	Rep...	Burglary ...	1½
.....	New York	Yes....	Rep...	Robbery	30
.....	Ohio (Co'l'r)	No....	None..	Murder 2nd	20
.....	Minnesota	Yes....	Rep...	Rec. stolen property..	1
.....	Ohio	No....	Rep...	Forgery	3
.....	Kentucky	No....	Rep...	Robbery	10
.....	Minnesota	Yes....	None..	Burglary 2nd	5
.....	New York	Yes....	Dem...	Robbery	15
.....	New York	Yes....	None..	Robbery	3
.....	Penn	Yes....	None..	Burglary	1
Irish .....	.....	No....	None..	Murder 2nd	Life..
.....	Minnesota	Yes....	Dem...	Rec. stolen property..	1
Irish .....	.....	No....	Dem...	Assault (2 convictions)	10
.....	Ohio	No....	Rep...	Murder 2nd ..	15
.....	Wisconsin	No....	Rep...	Grand Larceny	2
.....	Wisconsin	Yes....	Rep...	Grand Larceny	12
.....	Wisconsin	Yes....	Rep...	Grand Larceny	12
South Am .....	.....	No....	Rep...	Forgery	5
.....	New York	No....	Rep...	Manslaughter	10
.....	Missouri	No....	Dem...	Grand Larceny	1
.....	Wisconsin	No....	Rep...	Forgery (3 convict's..)	6
.....	New York	No....	Rep...	Grand Larceny	5
.....	Missouri	No....	Rep...	Assault	2
.....	Minnesota	No....	Rep...	Murder 2nd	Life..
.....	Michigan	No....	Rep...	Grand Lraceny	2
.....	Iowa	No....	Rep...	Perjury	2
.....	Indiana	No....	Rep...	Grand Larceny	5
.....	Indiana	No....	Rep...	Grand Larceny	3
.....	Illionois	No....	Rep...	Manslaughter	10
Italy .....	.....	No....	Rep...	Cheating	2 ½
Manitoba .....	.....	No....	Rep...	Grand Larceny	2
Canada .....	.....	No....	Rep...	Manslaughter	7
.....	Nebraska	No....	Rep...	Grand Larceny	1
.....	Missouri	No....	Rep...	Perjury	3
.....	Missouri	No....	Rep...	Murder 2nd	10
.....	Missouri	No....	Rep...	Obtain'g money false.	1½
.....	New Jersey	No....	Dem...	Grand Larceny	5
.....	Montana	No....	Dem...	Grand Larceny	2
.....	Missouri	No....	Dem...	Forgery	2
.....	Michigan	Yes....	Dem...	Forgery	5
.....	Kentucky	No....	Dem...	Burglary	2
.....	Illinois .....	.....	Dem...	Burglary	3
.....	Illinois	No....	Dem...	Grand Larceny	5
.....	Connecticut .....	.....	Dem...	Assault 1st	5
Canadian .....	.....	No....	Dem...	Grand Larceny	4
German .....	.....	No....	Dem...	Burglary	1
Swede .....	.....	No....	Dem...	Murder 2nd	16
.....	Oregon	No....	Rep...	Burglary	2
.....	Virginia	No....	Dem...	Rape	40
.....	Ohio	No....	Dem...	Assault	5
.....	Utah	No....	None..	Rape	25
.....	.....	No....	None..	Rape	Life..

RESULTS OF A SOCIOLOGICAL INVESTIGATION MADE UP

OCCUPATION	Age	Religion	Attendance at Sunday School to Age of	Use of Liquor	Use of Tobacco	EDUCATION		Raised in City, Town or Country
						Years Attendance at School	Age When Stopped School	
Rancher	42	Lutheran		No....	Chew ..	6	15	City
Rancher	18			No....	Chew ..	4	11	Country
Rancher	25	Methodist ..	7	No....	No....	12	18	Town
Rancher	40			Yes....	C. & S	12	23	Country
Rancher	41	Presbyter'n	8	No....	Smoke	7	17	Country
Rancher	21			Yes....	Smoke	7	16	City
Rancher	33		8	No....	Smoke	5	16	Country
Rancher	62	Catholic ..		Yes....	Smoke	4	10	Country
Rancher	19			No....	Smoke			Country
Rancher	41			No....	Smoke			Country
Rancher	25	Catholic ..		Yes....	Smoke	3	12	Country
Rancher	21			No....	No....	7	18	Country
Sailor	25	Episcopal ..		Yes....	Yes....	3	10	City
Sailor	31	None		Yes....	No....			Town
Sailor	21	None		Yes....	Smoke	5	12	Town
Saloonkeeper	34	None		Yes....	C. & S	8	16	City
Sewing Machine Opr	32	Episcopal ..		Yes....	No....	4	10	Town
Sheepherder	26	Catholic ..	7	Yes....	No....	8	15	Country
Sheepherder	32	Lutheran ..	7	No....	No....	7	19	Country
Sheepherder	42			Yes....	Chew ..	7	16	Town
Shingle weaver	28			Yes....	Smoke	7	16	Town
Shoemaker	20			Yes....	C. & S	3	10	Country
Shoemaker	32	Catholic ..	7	Yes....	Smoke	6	13	Country
Soldier	32	Catholic ..		Yes....	Smoke	5	12	Town
Steamfitter	31	Methodist ..	7	Yes....	C. & S	5	12	City
Steamfitter and Plumber	38	Catholic ..	8	Yes....	Smoke	7	14	Town
Stockman	41	Methodist ..	8	Yes....	Chew ..	8	17	Country
Stockman	42			Yes....	C. & S	5	16	Town
Stone cutter and Waiter	34	Catholic ..	6	Yes....	C. & S	12	18	Country
Stonecutter	42	Presbyter'n	7	No....	Smoke	12	19	Town
Stonecutter	26			Yes....	Smoke	4	10	Country
Stonemason	29		29	No....	No....	6	12	Town
Stonemason	63			Yes....	Smoke	5	18	Town
Tailor	49	Lutheran ..	7	Yes....	Smoke	7	15	City
Tailor	38			No....	Smoke			City
Tailor	28	Methodist ..		Yes....	C. & S	6	13	Town
Tailor	36	Episcopal ..	7	No....	Smoke	7	16	City
Tanner	25	Methodist ..	7	No....	Chew ..	6	13	City
Trapper	31			No....	No....			Country
Teamster	34		6	Yes....	Yes....	10	18	City
Teamster	38			No....	Yes....			Country
Teamster	43	Catholic ..			Smoke	7	14	City
Teamster	24			Yes....	C. & S	3	12	Country
Teamster	21	Presbyter'n	7	Yes....	Smoke	7	17	Town
Teamster	38	Catholic ..	7	Yes....	No....	6	12	Country
Teamster	37			No....	Smoke	8	11	Country
Teamster	35	Methodist ..		No....	C. & S	3	10	Country
Teamster	50		5	Yes....	Yes....	12	18	Country
Teamster	41		12	Yes....	Yes....	5	12	City
Teamster	29			Yes....	Smoke	4	11	Country
Telegraph Operator	22	Catholic ..	8	No....	Smoke	9	17	City
Telegraph Operator	22	Catholic ..	11	No....	Smoke	9	17	City
Telegraph Operator	32			No....	Smoke	7	17	Town
Variety Performer	34			No....	Smoke	8	17	City
Veterinary Surgeon	37			Yes....	C. & S	4	11	City
Watchmaker	28	Catholic ..	8	No....	Smoke	5	12	Country
Waiter	26	Baptist ..		Yes....	Smoke	5	15	Town
Waiter	27			Yes....	Smoke			Country

FROM 369 CONVICTS IN THE STATE PENITENTIARY.—Continued

NATIVITY		Served Prison or Jail Sentence Before	Politics.....	Crime of Which Convicted	Term of Sentence— Years
Country	State in Which Born, if Born in United States				
.....	Wisconsin	No....	None..	Rape	2
.....	Montana	No....	None..	Forgery	1
.....	Kansas	No....	None..	Grand Larceny	4
.....	Iowa	No....	None..	Robbery	10
.....	Iowa	No....	None..	Assault 2nd	4
.....	Illinois	No....	None..	Forgery	1
.....	Illinois	No....	None..	Grand Larceny	5
Irish .....	.....	Yes...	None..	Burglary	2
$\frac{1}{4}$ Indian .....	.....	No....	None..	Manslaughter	10
$\frac{1}{2}$ Indian .....	.....	No....	None..	Rape	30
$\frac{1}{2}$ Indian .....	.....	No....	None..	Grand Larceny	1
German .....	.....	No....	None..	Burglary	1
England .....	.....	Yes...	Social.	Burglary ..	2
.....	Mass.....	No....	None..	Burglary ..	3
.....	Washington	No....	None..	Injury to public jail..	2
.....	Washington	No....	Rep..	Assault	10
.....	New York....	No....	Rep..	Inj. to jail (2 conv.)..	6
Scotland .....	.....	No....	None..	Murder 2nd	25
Norway .....	.....	No....	None..	Murder 2nd	40
.....	Mass.....	No....	Rep..	Murder 2nd	Life.
.....	Missouri	No....	Rep..	Injury to public jail..	1
.....	Wisconsin	No....	None..	Burglary	1
Irish .....	.....	No....	Rep..	Robbery	1
.....	Iowa (Col'r)	No....	Dem..	Burglary	10
.....	Minnesota	No....	None..	Murder 2nd	21
.....	Vermont	No....	Rep..	Grand Larceny	5
.....	Oklahoma	No....	Dem..	Grand Larceny	14
.....	Kentucky	No....	Rep..	Assault 1st	5
Irish .....	.....	Yes...	None..	Robbery	10
.....	Maryland	No....	Rep..	Burglary	3
.....	Missouri	No....	Rep..	Obtain'g money false.	1
Canada .....	.....	No....	Dem..	Manslaughter ..	8
Canada .....	.....	No....	Rep..	Assault int. murder..	14
Austria .....	.....	No....	None..	Manslaughter	10
.....	New York	No....	Dem..	Manslaughter ..	10
.....	Minnesota	Yes...	Dem..	Assault 1st	10
England .....	.....	No....	Rep..	Forgery	4
.....	Indiana	No....	Rep..	Murder 2nd	30
.....	Texas	No....	None..	Perjury	7
.....	Ohio.....	No....	Dem..	Burglary 1st	2
Canadian .....	.....	No....	None..	Rape	5
Canadian .....	.....	No....	Dem..	Rape	20
.....	Colorado	No....	None..	Grand Larceny	2
.....	Colorado	No....	None..	Grand Larceny	1
.....	Missouri	No....	None..	Robbery	1
.....	Ohio.....	No....	Dem..	Burglary	2
.....	Connecticut	No....	Dem..	Larceny	3
.....	Iowa	No....	Dem..	Assault 2nd	5
.....	New York	No....	Dem..	Burglary 1st	7
.....	Penn.....	No....	Dem..	Grand Larceny	2
Canadian .....	.....	No....	None..	Burglary 1st	1
Canadian .....	.....	No....	None..	Burglary 1st	1
.....	Wisconsin	No....	Rep..	Embezzlement	3½
.....	Rhode Island	No....	Dem..	Burglary	10
.....	Texas	No....	Rep..	Murder	99
German .....	.....	No....	None..	Grand Larceny	2
.....	Kentucky (Col'r)	Yes...	None..	Assault 1st	1
.....	Missouri (Col'r)	No....	None..	Grand Larceny	3½

EIGHTH BIENNIAL REPORT OF BUREAU

RESULTS OF A SOCIOLOGICAL INVESTIGATION MADE UP

OCCUPATION	Age	Religion	Attendance at Sunday School to Age of....	Use of Liquor	Use of Tobacco	EDUCATION		Raised in City, Town or Country
						Years Attended at School	Age When Stopped School	
Waiter	32	Catholic ..	.....	No....	No....	5	20	Town
Waiter	22	Presbyter'n	9	No....	Smoke	8	15	Country
Waiter	26	.....	.....	Yes....	Smoke	.....	.....	Town
Waiter	17	Presbyter'n	7	Yes....	C. & S	5	12	Town
Waiter	21	.....	.....	Yes....	Smoke	4	10	Town
Waiter	26	Methodist ..	6	Yes....	Smoke	7	15	City
Waiter	25	Methodist ..	8	Yes....	C. & S	8	17	City
Waiter	35	.....	.....	Yes....	Smoke	4	11	City
Waiter	24	Presbyter'n	8	No....	Smoke	12	18	Town
Weaver, Silk	28	.....	.....	No....	Chew.	6	14	Town
Wood turner	45	Catholic ..	.....	Yes....	Smoke	7	14	City
No occupation	35	Catholic ..	.....	Yes....	Chew.	4	11	Country
No occupation	42	Catholic ..	10	Yes....	Yes....	2	12	Country
No occupation	90	Catholic ..	.....	No....	Smoke	.....	.....	Country
No occupation	15	Catholic ..	6	No....	C. & S	5	13	City
No occupation	15	Catholic ..	7	No....	No....	3	10	City
No occupation	15	Catholic ..	14	Yes....	Smoke	8	14	Town
No occupation	21	Presbyter'n	9	No....	Smoke	5	11	City

Note:—C. & S. indicates chew and smoke.

AGES OF CONVICTS.

Ages	15	17	18	19	20	21	22	23	24	25	26
Number of convicts	4	1	3	9	9	14	11	4	13	18	15
Ages	27	28	29	30	31	32	33	34	35	36	37
Number of convicts	8	12	13	8	13	17	10	19	10	9	12
Ages	38	39	40	41	42	43	44	45	46	47	48
Number of convicts	14	6	10	16	12	6	4	4	4	5	5
Ages	49	50	51	52	53	54	55	56	60	61	62
Number of convicts	8	12	5	6	3	3	1	4	1	1	1
Ages	63	72	76	90	Total						
Number of convicts	2	1	1	1	369						

FROM 369 CONVICTS IN THE STATE PENITENTIARY.—Continued

NATIVITY		Served Prison or Jail Sentence Before.....	Politics.....	Crime of Which Convicted	Term of Sentence— Years.....
Country	State in Which Born, if Born in United States				
Irish .....	.....	Yes....	None..	Robbery	12
.....	Illinois.....	Yes....	None..	Burglary	3
.....	Kentucky.....	Yes....	None..	Burglary	5
.....	Missouri	No....	None..	Robbery	15
.....	Ohio	Yes....	None..	Burglary	5
.....	.....	Yes....	None..	Burglary	4
.....	Ohio	Yes....	Dem..	Robbery	6½
.....	Missouri	Yes....	Dem..	Burglary	5
.....	.....	Yes....	Rep..	Burglary	10
Switzerland .....	.....	No....	None..	Grand Larceny	3
German .....	.....	No....	None..	Murder 2nd	Life.
Canadian .....	.....	Yes....	Dem..	Petit Lar., 2d offense.	2
Manitoba	½ Indian	No....	None..	Grand Larceny ..	2
Manitoba	½ Indian	No....	None..	Grand Larceny	1
Irish .....	.....	No....	None..	Burglary	1
Irish .....	.....	No....	None..	Burglary	1
Irish .....	.....	No....	None..	Burglary	5
.....	S. Dakota	Yes....	None..	Assault	5

NATIONALITY.

Scotland	England	20
Switzerland	Indians and breeds	7
South America	Japan	1
Norway	Negroes	8
Sweden	Canada	25
Finland	Italy	7
Mexico	Ireland	22
Germany	United States	237
Austria	14	
5	Total	369

NATIVITY BY STATES OF CONVICTS BORN IN THE UNITED STATES.

Alabama	1	New Jersey	2
Arkansas	3	New York	31
Arizona	1	Ohio	16
California ..	4	Oklahoma	1
Colorado	4	Oregon	2
Connecticut ..	2	Pennsylvania ..	15
Illinois	16	Rhode Island ..	1
Indiana	5	South Dakota ..	3
Iowa	14	Tennessee	4
Kansas	3	Texas	5
Kentucky	9	Utah	1
Louisiana	1	Vermont	3
Maine	1	Virginia	3
Maryland	2	West Virginia ..	1
Massachusetts ..	9	Washington	2
Michigan	17	Wisconsin	13
Minnesota	11	Not given	9
Missouri	14		
Montana	5	Total	237
Nebraska	3		

RAISED IN COUNTRY, CITY OR TOWN.

	Number.	Per cent.
Country	127	34.42
Town	123	33.33
City	116	31.44
Not reported	3	.81
Total	369	100.00

OCCUPATIONS.

	No. of persons		No. of persons
Amalgamator	1	Machine hand	1
Baker	4	Mason	1
Barber	6	Lumberman	2
Bartender	3	Miller	1
Baseball Player	1	Miner	39
Blacksmith	5	Musician	1
Boilermaker	4	Painter	9
Bookkeeper	1	Paperhanger	1
Bootblack	1	Photographer	1
Bricklayer	1	Plasterer	1
Butcher	9	Plumber	2
Candymaker	1	Real Estate Dealer	3
Carpenter	5	Railroad men, excluding operators ..	9
Chiropodist	1	Ranchmen	42
Clerk	6	Sailor	3
Coachman and Showman	1	Saloonkeeper	1
Cooks	16	Sewing Machine Operator	1
Cooper	2	Shepherd	3
Cotton Miller	1	Shingleweaver	1
Cowboy	19	Shoemaker	2
Demimonde	2	Soldier	1
Dressmaker	1	Steamfitter	2
Electrician	3	Stockmen	2
Engineer	8	Stonecutter	3
Fireman	4	Stonemason	2
Foundryman	1	Tailor	4
Gambler	3	Tanner	1
Gardener	1	Trapper	1
Groceryman	1	Teamster	11
Harnessmaker	2	Telegraph Operator	3
Horseman	2	Variety Performer	1
Hospital Steward, Ass't	1	Veterinary Surgeon	1
Jockey	1	Watchmaker	1
Laborers	65	Waiter	11
Lapidary	1	Weaver, Silk	1
Laundryman	1	Wood Turner	1
Liveryman	1	None	1
Longshoreman	1		
Machinist	3	Total	369

YEARS ATTENDANCE AT SCHOOL AND AGE AT WHICH STOPPED.

No.	Years Attendance.	Age Stopped.	No.	Years Attendance.	Age Stopped.
41	None		47	years	19
16	months		17	years	20
19	months	14	38	years	13
11	year	8	98	years	14
11	year	15	98	years	15
11½	years	14	158	years	16
12	years	10	168	years	17
32	years	12	28	years	18
43	years	9	18	years	19
133	years	10	18	years	20
53	years	12	18	years	22
23	years	13	39	years	15
23	years	16	39	years	16
14	years	9	29	years	17
164	years	10	19	years	19
174	years	11	110	years	16
54	years	12	110	years	17
24	years	13	310	years	18
24	years	14	110	years	19
14	years	16	211	years	15
15	years	11	111	years	16
105	years	12	111	years	17
85	years	13	111	years	21
15	years	14	912	years	18
35	years	15	712	years	19
45	years	16	312	years	20
25	years	17	212	years	21
15	years	18	112	years	22
25	years	20	112	years	23
15	years	25	112	years	28
16	years	10	113	years	21
116	years	12	114	years	21
126	years	13	115	years	20
36	years	14	116	years	20
56	years	15	118	years	21
26	years	16	1*	.....	11
26	years	17	2*	.....	13
26	years	21	2*	.....	14
87	years	13	4*	.....	16
87	years	14	2*	.....	17
107	years	15	1*	.....	18
227	years	16			
47	years	17		Total	369
37	years	18			

* Indicates very little attendance and so irregular as to be impossible to estimate the length of time.

NUMBER AND PERCENTAGE OF TIME ATTENDED SCHOOL.

Number.	Per cent.	Time Attended.
41	11.11	Never attended.
12	3.26	Very little and so irregular as to be impossible to estimate.
4	1.08	1 year or less.
1	.27	1½ years.
4	1.08	2 years.
26	7.05	3 years.
44	11.92	4 years.
33	8.94	5 years.
38	10.30	6 years.
60	16.26	7 years.
57	15.45	8 years.
9	2.44	9 years.
6	1.63	10 years.
5	1.36	11 years.
24	6.50	12 years.
1	.27	13 years.
1	.27	14 years.
1	.27	15 years.
1	.27	16 years.
1	.27	18 years.
369	100.00	

RELIGION OF CONVICTS OR RELIGIOUS ENVIRONMENT DURING CHILDHOOD.

	No.	Per cent.		No.	Per cent.
Atheist	1	.27	Methodist ..	41	11.11
Baptist	9	2.44	Presbyterian ..	28	7.59
Catholic	89	24.12	Protestant ..	10	2.71
Christian	4	1.08	Salvationist ..	3	.81
Deist..	1	.27	None	148	40.11
Episcopal	16	4.34			
Lutheran	18	4.88	Total	369	100.00
Mormon	1	.27			

ATTENDANCE AT SUNDAY SCHOOL.

Age at which stopped attendance.....	5	6	7	8	9	10	12
Number of persons	1	33	63	34	10	8	3
Age at which stopped attendance.....	13	14	15	16	17	18	19
Number of persons	4	7	2	7	2	5	1
Age at which stopped attendance	20	22	29				
Number of persons	1	1	1	Never attended—186			

Note—Those attending Sunday School from the age of 5 to 10 years, inclusive, were 35.50 per cent. Those attending from 11 to 29 years of age, inclusive, comprise 14.09 per cent. Those never having the advantage of Sunday School instruction comprise 50.41 per cent.

USE OF LIQUOR.

226, or 61.25 per cent were in the habit of using liquor in degrees from extreme moderation to excess. 143, or 38.75 per cent did not use it at all.

USE OF TOBACCO.

59, or 15.99 per cent do not use tobacco at all; 129, or 34.96 per cent smoke; 34, or 9.21 per cent chew; 65, or 17.62 per cent both chew and smoke; 82, or 22.22 per cent use tobacco in one or both forms that was not definitely ascertained.

POLITICS.

	Number.	Per cent.
Republicans	99	26.83
Democrats	84	22.77
No politics	180	48.78
Populists	3	.81
Socialist	2	.54
Nihilist	1	.27
Total	369	100.00

SERVED PRISON OR JAIL SENTENCES BEFORE.

	Number.	Per cent.
Yes	72	19.51
No	288	78.05
Not stated	9	2.44
Total	369	100.00

BUILDING IMPROVEMENTS.

The conditions which prevail among the building trades are usually taken as a criterion of the progress of a community, and in Montana the extent as well as the nature of the buildings erected indicate, perhaps, as clearly as any other single feature the substantial growth and permanent development of the State. It was to demonstrate this in as concise a form as possible that the work of gathering figures estimating the value of building operations of all kinds and on all classes of property for the year 1901 was undertaken by the Bureau. In the main these estimates have been obtained on the spot from contractors but the most of the smaller towns were compiled by the courtesy of the postmasters. The Butte returns were made by Building Inspector Chas. H. Lane, the only officer of this character in any city of the State. It may be readily surmised that in a city requiring building permits the value of the buildings actually constructed is a considerable percentage higher than asked for in the permits on account of the record they leave for taxation purposes. In fact this was stated by a contractor to be the case in Butte.

The totals as shown in the tables are eloquent of the tremendous though permanent and healthy growth throughout the entire State. Nearly every community seems to have shared in this advance and much of the added values are in the shape of business blocks that would be a credit to much larger cities than Montana can boast of. By far the greater portion of residences were built for occupancy by those who own them and shows that our citizens are fully alive to the desirability of owning their own homes and also demonstrates in a large degree that Montana has been deliberately chosen as their "home" State.

The amount expended in manufacturing plants, mills and kindred structures shows remarkable development along this line and clearly points to the time when there will be no inconsiderable amount of manufacturing going on in Montana aside from the mills and smelters. Undoubtedly there were a good many improvements made upon mines, mills and smelters that were not reported at all as many of these were located at long distances from post-offices and overlooked. In fact there were very few reports which included any buildings erected in the country at all.

Railroad buildings and the other classifications also show healthy growth and add their quota of testimony to the faith in the future that abides in the Montana investor and her people.

While the investigation was necessarily confined to a specified 12 months it is gratifying to be able to say that the year 1902 also showed remarkable development in the same direction it being stated by contractors of some of the cities that the improvements in that year would exceed those for the year under consideration, demonstrating the fact that 1901 was not a boom year and that the progress showed during that 12 months was not extraordinary or unusual.

ESTIMATE OF VALUE OF BUILDINGS ERECTED AND IMPROVEMENTS MADE UPON BUILDINGS AT VARIOUS
POINTS IN MONTANA DURING THE YEAR 1901.
BEAVERHEAD COUNTY.

TOWN	Private Dwellings, Barns and Other Outbuildings	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc.....	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc...	Public Works— Sewers, Lighting and Water Works, Plants, Park Im- provements, Etc.	Railroad Buildings	Other Improve- ments Not Class- ified.	Total
Argenta .....	.....	.....	.....	.....	.....	.....	.....	.....
Bainnack	1,000	.....	.....	.....	.....	.....	.....	1,000
Bowen	3,500	.....	.....	.....	.....	.....	.....	3,500
Briston .....	.....	.....	.....	.....	.....	.....	.....	.....
Deer	2,500	3,000	.....	100	.....	4,000	.....	9,600
Dewey	50	50	.....	.....	.....	.....	.....	100
Dillon	34,800	18,000	.....	58,200	.....	.....	.....	111,000
Fox .....	.....	.....	.....	.....	.....	.....	.....	.....
Grant	7,000	.....	.....	50	.....	.....	.....	7,050
Jackson .....	.....	.....	.....	.....	.....	.....	.....	.....
Lima .....	.....	.....	.....	.....	.....	.....	.....	.....
Lima	1,500	.....	1,000	.....	1,500	.....	.....	4,000
Polaris	10,000	200	.....	.....	1,000	.....	.....	11,200
Red Rock .....	.....	.....	.....	.....	.....	.....	.....	.....
Willis .....	.....	.....	.....	.....	.....	.....	.....	.....
Wisdom .....	.....	.....	.....	.....	.....	.....	.....	.....
Total Beaverhead County	60,350	21,250	1,000	58,350	2,500	4,000	2,000	119,450

BROADWATER COUNTY.

TOWN	Private Dwellings, Barns and Other Outbuildings	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc.....	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc...	Public Works— Sewers, Lighting and Water Works, Plants, Park Im- provements, Etc.	Railroad Buildings	Other Improve- ments Not Class- ified.	Total
Canton	1,550	.....	.....	75	.....	.....	.....	1,625
Diamond .....	.....	.....	.....	.....	.....	.....	.....	.....
Greenwood .....	.....	.....	.....	.....	.....	.....	.....	.....
Hassel	200	75	1,250	.....	135	.....	300	1,960
Lemhard	200	.....	.....	.....	.....	.....	.....	200
Radarsburg	200	300	50	.....	200	.....	.....	1,200
Toston	2,000	1,500	.....	.....	.....	1,500	.....	5,000
Townsend	14,600	400	.....	11,000	.....	.....	.....	26,000
Winston .....	.....	.....	.....	.....	.....	.....	.....	.....
Total Broadwater County	18,750	2,275	1,750	11,075	335	1,500	300	35,985

ESTIMATE OF BUILDING IMPROVEMENTS—Continued.
CARBON COUNTY.

TOWN	Private Dwellings, Barns and Other Outbuildings.....	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc...	Public Works, Sewers, Lighting and Water Works Plants, Park Im- provements, Etc.	Railroad Build- ings	Other Improve- ments Not Class- ified.....	Total
Absaroke	3,700	4,000				1,000		7,700
Bowler	2,000	3,000						6,000
Bridger								
Carbonado								
Chance								
Ewing		1,000	2,000					8,000
Gabo	5,000							
Golden								
Joliet	5,725							5,725
Red Lodge	63,650	6,850	32,000	1,300				103,800
Roberts	500	200			500		600	700
Rockdale	2,500							3,600
Silesia		800						800
Total Carbon County	83,075	15,850	34,000	1,300	500	1,000	600	136,325

CASCADE COUNTY.

Adel	7,500							7,500
Albright								
Armington	2,000							2,000
Barker	1,200	300			300			1,500
Belt	1,000	2,000			5,000			6,500
Cascade	3,000							8,000
Cora								
Eden			500		500		2,000	23,000
Evans	20,000		500		250		500	3,600
Geer	2,000							
Geysor								
Great Falls	400,000	200,000		250,000	100,000	20,000	1,000	970,000
Hardy	2,000				50			3,000
Hepler								
Houskin	1,500			800				2,300
Kibbey	1,000	300		600		600		2,500
Mideanon								
Milligan								

ESTIMATE OF BUILDING IMPROVEMENTS—Continued.

CASCADE COUNTY—Continued.

TOWN	Private Dwellings, Barns and Other Outbuildings.....	Business Houses, Warehouses, Etc	Manfg. Plants, Mills, Mine Buildings, Shops, Etc.....	Public Buildings, Such as Schools, Jails, Court- Houses, Poor Farms, Churches, Hospitals, Etc...	Public Works, Sewers, Lighting and Water Works Plants, Park Im- provements, Etc.	Railroad Build- ings.....	Other Improve- ments Not Class- ified.....	Total
Monarch .....	.....	.....	.....	.....	.....	.....	.....	.....
Nehalem	1,200	.....	105,000	.....	.....	.....	.....	106,200
Orr .....	.....	.....	.....	.....	.....	.....	.....	.....
Riceville .....	.....	.....	.....	.....	.....	.....	.....	.....
St. Peter .....	.....	.....	.....	.....	.....	.....	.....	.....
Sand Coulee .....	.....	.....	.....	.....	.....	.....	.....	.....
Stockett	24,000	.....	.....	.....	.....	.....	.....	24,000
Sunnyside .....	.....	.....	.....	.....	.....	.....	.....	.....
San River .....	.....	.....	.....	.....	.....	.....	.....	.....
Truly .....	.....	.....	.....	.....	.....	.....	.....	.....
Ulm .....	.....	.....	.....	.....	.....	.....	.....	.....
Total Cascade County	466,400	202,600	108,000	252,950	106,100	20,600	3,500	1,160,150

CHOTEAU COUNTY.

Ada .....	.....	.....	.....	.....	1,000	.....	.....	1,000
Beatrice .....	.....	.....	.....	.....	.....	.....	.....	.....
Big Sandy .....	.....	.....	.....	200	.....	.....	.....	200
Box Elder	2,500	.....	.....	.....	.....	.....	.....	2,500
Chester	1,125	550	.....	.....	.....	.....	600	2,275
Chinook	18,700	27,000	.....	4,000	1,900	.....	.....	51,600
Cleveland .....	.....	.....	.....	.....	.....	.....	.....	.....
Dodson .....	.....	.....	.....	.....	.....	.....	.....	.....
Ft. Assiniboine .....	.....	.....	.....	.....	.....	.....	.....	.....
Ft. Benton	11,000	.....	.....	.....	10,000	4,000	3,000	28,000
Gold Butte	5,000	3,150	6,000	.....	1,500	.....	.....	15,650
Harlem	2,700	2,500	.....	.....	.....	1,500	.....	6,700
Havre	28,000	34,000	.....	.....	.....	100,000	6,000	168,000
Maddux	200	.....	.....	.....	.....	.....	.....	200
Steele	1,500	.....	.....	.....	250	.....	500	2,250
Teton	4,000	.....	.....	20	.....	.....	3,000	7,200
Warrick .....	.....	.....	.....	.....	.....	.....	.....	.....
Total Choteau County	74,725	67,200	6,000	4,400	14,500	105,500	13,100	285,575

ESTIMATE OF BUILDING IMPROVEMENTS—Continued.

CUSTER COUNTY.

TOWN	Private Dwellings, Barns and Other Outbuildings.....	Business Houses, Warehouses, Etc.	Mnfg. Plants, Mills, Mine Buildings, Shops, Etc.....	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc...	Public Works, Sewers, Lighting and Water Works Plants, Park Im- provements, Etc.	Railroad Build- ings	Other Improve- ments Not Class- ified.....	Total.....
Ashland	3,000	1,500	.....	1,000	2,000	.....	.....	7,500
Blatchford	250	.....	.....	.....	75	50	.....	375
Brandenburg	10,000	.....	.....	400	.....	.....	.....	10,400
Ekalaka	1,000	.....	.....	.....	.....	.....	.....	1,000
Ferris .....	.....	.....	.....	.....	.....	.....	.....	.....
Ft. Keogh .....	.....	.....	.....	20,000	.....	.....	.....	20,000
Kinsey	500	.....	.....	.....	.....	.....	.....	500
Knowlton	250	.....	.....	.....	.....	.....	.....	250
Moorhead	500	.....	.....	.....	.....	.....	.....	1,500
Miles City	24,000	4,000	.....	.....	1,000	.....	.....	28,000
McKay	1,500	.....	.....	.....	.....	.....	.....	1,500
Pewderville	2,000	.....	.....	.....	.....	.....	.....	2,000
Stacey	1,500	.....	.....	500	1,000	.....	.....	3,000
Terry	3,500	1,000	.....	100	.....	.....	.....	4,600
Total Custer County	48,000	6,500	.....	22,000	4,075	50	.....	80,625

DAWSON COUNTY.

Glendive	15,800	33,000	400	.....	3,980	150	65,000	118,330
Hodges.....	.....	.....	.....	250	.....	.....	.....	250
Jordan	200	.....	.....	.....	.....	.....	.....	200
Preston .....	.....	.....	.....	.....	.....	.....	.....	.....
Sanford	200	.....	.....	500	1,000	.....	.....	1,700
Sidney	3,075	.....	.....	600	.....	.....	1,000	4,675
Tokna	1,000	.....	.....	.....	.....	.....	.....	1,000
Wibaux	2,325	.....	.....	.....	.....	300	.....	2,625
Total Dawson County	22,600	33,000	400	1,350	4,980	450	66,000	128,780

ESTIMATE OF BUILDING IMPROVEMENTS Continued.

DEER LODGE COUNTY.

TOWN	Private Dwellings, Barns and Other Outbuildings.....	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc.....	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc. ..	Public Works, Sewers, Lighting and Water Works Plants, Park Im- provements, Etc.	Railroad Build- ings	Other Improve- ments Not Class- ified.....	Total.....
Amecunda	105,000	.....	800,000	50,000	.....	.....	.....	955,000
Deer Lodge	4,900	2,000	.....	5,000	.....	.....	500	12,400
Stewart	150	.....	.....	.....	.....	.....	75	225
Total Deer Lodge County.....	110,050	2,000	800,000	55,000	.....	.....	575	967,625

FERGUS COUNTY.

Alpine .....	.....	.....	.....	.....	.....	.....	.....	.....
Boerfield	6,000	.....	.....	.....	.....	.....	.....	6,000
Edgewater .....	.....	.....	.....	.....	.....	.....	.....	.....
Everson .....	.....	.....	.....	.....	.....	.....	.....	.....
Fergus .....	.....	.....	.....	.....	.....	.....	.....	.....
Flatwillow	500	.....	.....	.....	.....	.....	.....	6,100
Lewistown	50,000	25,000	5,000	1,500	1,300	.....	4,300	86,500
New Year	1,000	.....	20,000	100	5,000	.....	.....	21,100
Phillbrook	2,100	100	.....	.....	.....	.....	.....	2,700
Rockford	3,450	.....	.....	.....	.....	.....	.....	3,450
Stanford	5,000	.....	.....	250	100	.....	.....	5,350
Somerville	7,000	2,500	500	.....	.....	.....	.....	10,000
Ubet	1,500	100	.....	.....	.....	.....	.....	1,600
Utica	3,500	800	.....	.....	.....	.....	.....	4,300
Yale	400	.....	.....	.....	.....	.....	1,280	2,280
Total Fergus County	80,450	28,500	25,500	1,850	7,000	.....	6,080	149,380

FLATHEAD COUNTY.

Pelton	2,000	.....	.....	.....	.....	.....	.....	2,000
Creston	8,000	.....	5,000	.....	.....	.....	.....	13,000
Dayton	1,500	1,000	.....	.....	500	.....	.....	2,500
Glen	150	.....	.....	.....	.....	.....	.....	150
Holt	1,000	100	50,000	10,000	30,000	.....	.....	91,100
Jennings .....	.....	2,000	.....	.....	.....	.....	.....	2,000
Kalispell	229,200	84,000	.....	16,800	8,200	.....	.....	338,200

ESTIMATE OF BUILDING IMPROVEMENTS—Continued.

FLATHEAD COUNTY—Continued.

TOWNS	Private Dwellings, Barns and Other Outbuildings.....	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc.....	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc....	Public Works, Sewers, Lighting, and Water Works Plants, Park Im- provements, Etc.	Railroad Build- ings.....	Other Improve- ments Not Class- ified.....	Total
Libby	2,500	10,000	.....	.....	5,000	.....	.....	17,500
Marston	2,000	800	.....	500	200	.....	1,000	4,500
Montford	3,760	.....	.....	.....	.....	.....	250	3,760
Sheldon	6,000	.....	.....	.....	.....	.....	.....	6,250
Sylvanite .....	.....	.....	.....	.....	.....	.....	.....	.....
Troy	1,000	1,500	.....	.....	.....	.....	.....	2,500
Total Flathead County	257,110	99,400	55,000	27,300	43,900	.....	1,250	483,960

GALLATIN COUNTY.

Belgrade	5,000	.....	.....	.....	.....	.....	.....	5,000
Bozeman	59,000	77,000	.....	1,000	20,000	.....	.....	157,000
Cedar View .....	.....	.....	.....	.....	.....	.....	.....	.....
Central Park .....	.....	.....	600	.....	.....	.....	.....	.....
Chestnut	775	.....	.....	1,500	.....	.....	.....	1,375
Gallop	1,600	500	.....	.....	.....	.....	.....	3,600
Grayling	8,000	500	.....	.....	300	.....	.....	8,800
Manhattan	100	500	1,000	2,000	.....	.....	.....	3,600
Salesville	500	200	.....	.....	2,500	.....	.....	3,400
Sedan	3,500	.....	.....	2,000	1,500	.....	.....	7,000
Spring Hill	3,200	.....	8,000	.....	200	250	.....	11,650
Three Forks	1,750	.....	.....	60	150	.....	.....	1,900
Total Gallatin County	83,425	78,900	9,600	6,560	24,650	250	.....	203,385

GRANITE COUNTY.

Drummond	300	1,400	.....	1,000	100	300	.....	3,100
New Chicago	1,000	1,200	.....	1,400	.....	.....	.....	3,600
Philipsburg .....	.....	.....	.....	.....	.....	.....	10,000	25,000
Stone .....	.....	.....	15,000	.....	.....	.....	.....	.....
Total Granite County	1,300	2,600	15,000	2,400	100	300	10,000	31,700

ESTIMATE OF BUILDING IMPROVEMENTS—Continued.
JEFFERSON COUNTY.

TOWN	Private Dwellings, Barns and Other Outbuildings	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc.	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Etc.	Public Works— Sewers, Lighting and Water Works Plants, Park Im- provements, Etc.	Railroad Build- ings	Other Improve- ments Not Class- ified	Total
Atholra	6,000	.....	200	.....	.....	.....	.....	6,200
Boulder	4,800	.....	.....	40,500	.....	1,200	.....	46,500
Essex	2,000	250	.....	60	.....	20	.....	2,330
Elkhorn	2,000	200	150,000	.....	.....	20	2,000	151,400
Honestake	550	.....	.....	.....	.....	250	.....	800
Jefferson .....	.....	.....	.....	.....	.....	.....	.....	.....
Lane Spur	300	.....	.....	.....	.....	.....	.....	300
Whitchall	8,500	.....	.....	260	.....	.....	.....	8,500
Wickes .....	.....	1,500	.....	.....	.....	.....	.....	1,500
Total Jefferson County	24,150	1,950	150,200	40,820	.....	1,670	2,000	220,790

LEWIS AND CLARKE COUNTY.

Augusta	2,000	7,000	.....	1,500	.....	.....	.....	10,500
Bald Butte .....	.....	.....	400	.....	.....	.....	.....	400
Canyon Ferry .....	.....	.....	.....	.....	.....	.....	.....	.....
Craig	400	600	.....	.....	.....	.....	.....	1,000
Clemens	100	100	.....	.....	40,000	.....	.....	40,200
Hogan	500	30,000	.....	300	100,000	.....	.....	130,500
Helena	37,567	12,970	25,000	79,000	.....	.....	957	155,564
Marysville .....	.....	.....	.....	.....	.....	.....	.....	.....
Rimmi	150	.....	600	.....	.....	450	.....	1,200
Silver	1,300	800	.....	300	.....	1,000	.....	3,400
Total Lewis and Clarke County	42,017	51,470	26,000	81,170	140,000	1,450	957	343,064

MADISON COUNTY.

Cameron .....	.....	.....	.....	.....	1,200	.....	.....	1,200
Ennis	4,900	3,000	500	.....	500	.....	.....	8,900
Laurin	6,000	.....	.....	6,000	.....	.....	.....	12,000
Norris	500	200	152,000	50	.....	.....	.....	152,750
Pageville	5,000	.....	.....	2,400	1,000	.....	.....	8,400

ESTIMATE OF BUILDING IMPROVEMENTS--Continued.

MADISON COUNTY--Continued.

TOWNS	Private Dwellings, Barns and Other Outbuildings....	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc.....	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc...	Public Works, Sewers, Lighting and Water Works, Plants, Park Im- provements, Etc.	Railroad Build- ings.....	Other Improve- ments Not Class- ified.....	Total
Parrot	600	50	800	1,600	.....	.....	.....	3,050
Pony	9,000	7,000	110,000	200	400	50	.....	126,650
Puller Springs ..	3,500	.....	.....	.....	500	.....	.....	4,000
Rochester	23,090	10,800	8,000	.....	.....	.....	.....	41,890
Sheridan	2,000	.....	.....	6,000	600	.....	.....	8,600
Silver Star	1,300	900	2,500	.....	.....	.....	.....	4,700
Virginia City	10,000	3,700	17,500	350	100	.....	.....	31,650
Waterloo	6,500	.....	.....	1,000	.....	.....	.....	7,500
Total Madison County	72,390	25,650	291,300	17,800	4,300	50	.....	411,290

MEAGHER COUNTY.

Copper	5,000	500	3,000	.....	.....	.....	.....	8,500
Dorsey .....	.....	.....	.....	.....	.....	.....	.....	.....
Harlowton	500	150	.....	.....	.....	.....	685	1,335
Oka	1,000	.....	.....	.....	.....	.....	.....	1,000
Shawmut ..	2,700	.....	.....	.....	900	.....	.....	3,600
Unity	350	.....	.....	500	500	.....	.....	1,350
White Sulphur Springs..	3,000	1,000	.....	.....	.....	.....	.....	4,000
Total Meagher County	12,550	1,650	3,000	500	1,400	.....	685	19,785

MISSOULA COUNTY.

Arlee .....	.....	.....	.....	.....	.....	.....	.....	.....
Blanchard .....	.....	.....	.....	.....	.....	.....	.....	.....
Clinton	1,000	4,000	10,000	.....	.....	1,000	.....	16,000
Deborgia	1,500	1,000	75,000	500	.....	.....	.....	78,000
Eddy	300	.....	.....	.....	.....	.....	.....	300
Frenchtown	5,000	2,000	.....	.....	.....	.....	.....	7,000
Grantsdale .....	.....	200	.....	.....	.....	.....	.....	200
Heron	850	.....	1,000	.....	.....	.....	.....	1,850
Iron Mountain	1,600	.....	7,000	.....	.....	8,000	.....	16,600

ESTIMATE OF BUILDING IMPROVEMENTS—Continued.

MISSOULA COUNTY—Continued.

TOWN	Private Dwellings, Barns and Other Outbuildings	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc.....	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc...	Public Works, Sewers, Lighting and Water Works Plants, Park Im- provements, Etc.	Railroad Build- ings.....	Other Improve- ments Not Class- ified.....	Total.....
Jacko	1,000	.....	.....	250	.....	250	.....	1,500
Leo Lo.....	10,000	.....	.....	1,000	.....	.....	.....	11,000
Martina	3,000	.....	50,000	.....	.....	.....	.....	53,000
Missoula	185,982	43,000	58,000	7,000	.....	.....	.....	293,982
Noxon	1,000	1,100	.....	.....	.....	.....	.....	2,100
Plains	6,700	350	.....	300	.....	.....	.....	7,350
Quartz	100	350	.....	.....	.....	.....	.....	450
Ravalli .....	.....	.....	.....	.....	.....	.....	.....	.....
St. Ignatius	500	1,500	.....	400	.....	.....	.....	2,400
Saltese	2,000	.....	.....	.....	.....	.....	.....	2,000
Superior	35	750	.....	.....	.....	.....	.....	755
Total Missoula County	220,567	54,250	201,000	9,450	.....	9,250	.....	494,517

PARK COUNTY.

	Private Dwellings, Barns and Other Outbuildings	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc.....	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc...	Public Works, Sewers, Lighting and Water Works Plants, Park Im- provements, Etc.	Railroad Build- ings.....	Other Improve- ments Not Class- ified.....	Total.....
Aldridge	800	300	1,000	.....	.....	.....	.....	2,100
Chimney Rock	100	100	.....	100	.....	.....	.....	300
Cinnabar .....	.....	8,000	.....	.....	.....	.....	.....	8,000
Contact	325	.....	1,000	.....	200	.....	.....	7,525
Fridley .....	.....	.....	.....	.....	.....	.....	.....	.....
Gardiner	1,000	1,000	.....	.....	.....	.....	.....	2,000
Hoffman .....	.....	.....	.....	.....	.....	.....	.....	.....
Horr	7,500	350	735	2,000	1,345	.....	.....	11,930
Hunter's Hot Springs	3,000	.....	.....	.....	.....	.....	.....	3,000
Livingston	61,600	87,700	650	4,350	.....	205,000	.....	359,300
Muir	4,000	.....	.....	.....	150	.....	.....	4,150
Springdale	2,000	.....	.....	.....	.....	.....	.....	2,000
Total Park County	80,325	97,450	9,385	6,450	1,695	205,000	.....	400,305

ESTIMATED BUILDING IMPROVEMENTS—Continued.

POWELL COUNTY.

TOWNS	Private Dwellings, Barns and Other Outbuildings. ...	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc ..	Public Works, Sewers Lighting and Water Works Plants, Park Im- provements, Etc.	Railroad Build- ings.....	Other Improve- ments Not Class- ified	Total
Avon	1,050	2,200	.....	.....	.....	.....	.....	3,200
Coloma	1,000	150	15,000	.....	.....	.....	.....	16,150
Elliston	400	700	.....	600	.....	200	.....	1,900
Garrison .....	.....	.....	.....	.....	.....	.....	.....	.....
Helmville .....	.....	2,000	.....	.....	.....	.....	.....	2,000
Ovando	5,000	500	500	100	.....	.....	.....	6,100
Sunset .....	.....	.....	.....	.....	.....	.....	.....	.....
Total Powell County	7,450	5,550	15,500	700	.....	200	.....	29,400

RAVALLI COUNTY.

Corvallis	1,100	6,000	.....	200	.....	.....	.....	7,300
Florence .....	.....	.....	.....	.....	.....	.....	.....	.....
Rosemont	600	.....	.....	.....	.....	.....	.....	600
Stevensville	8,500	.....	250	10,000	.....	.....	.....	18,750
Total Ravalli County	10,200	6,000	250	10,200	.....	.....	.....	26,650

ROSEBUD COUNTY.

Forsyth	25,900	2,000	.....	1,000	.....	13,000	1,500	43,400
Howard	80	.....	.....	.....	200	2,000	.....	2,280
Rancher	600	.....	.....	.....	.....	.....	.....	600
Rosebud	2,000	.....	.....	.....	.....	.....	.....	2,000
Sabra	1,000	.....	.....	.....	.....	.....	.....	1,000
Total Rosebud County	29,580	2,000	.....	1,000	200	15,000	1,500	49,280

ESTIMATED BUILDING IMPROVEMENTS Continued.
SILVER BOW COUNTY.

TOWN	Private Dwellings, Barns and Other Outbuildings	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc.....	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc...	Public Works, Sewers, Lighting and Water Works Plants, Park Im- provements, Etc.	Railroad Build- ings.....	Other Improve- ments Not Class- ified.....	Total.....
Burlington	1,000	.....	2,000	.....	.....	3,000	.....	6,000
Butte	225,000	550,575	60,000	125,000	41,051	50,000	.....	1,055,226
Gregson	5,000	2,000	.....	1,000	.....	.....	.....	8,000
Gunderson	4,000	300	.....	.....	.....	.....	.....	4,300
Melrose	3,900	.....	.....	.....	.....	.....	.....	3,900
Walkerville	3,000	1,500	.....	35,000	.....	.....	.....	39,500
Total Silver Bow County	241,900	554,375	62,000	161,000	44,051	53,000	.....	1,116,926

SWEET GRASS COUNTY.

Big Timber	8,000	3,000	1,200	.....	.....	.....	.....	12,200
Grey Cliff	725	.....	.....	.....	.....	.....	.....	725
McLeod	2,000	.....	.....	600	.....	.....	.....	2,600
Merrill .....	.....	.....	.....	.....	.....	1,500	.....	1,500
Nye .....	.....	.....	.....	250	.....	.....	.....	250
Wormser	150	.....	500	41	.....	.....	.....	640
Total Sweet Grass County	10,875	3,000	1,700	890	.....	1,500	.....	17,965

TETON COUNTY.

Brighton	200	.....	.....	2,500	.....	.....	.....	200
Choteau	1,500	6,000	.....	.....	.....	.....	.....	10,000
Dupuyer	3,500	1,500	.....	.....	.....	.....	.....	5,000
Elizabeth .....	.....	.....	.....	.....	.....	.....	.....	.....
Kipp	65,000	500	30,000	.....	5,000	.....	.....	100,500
Lowry	4,000	.....	.....	.....	75,000	.....	.....	79,000
Pondera	100	.....	.....	.....	.....	.....	.....	100
Raymond	1,200	.....	.....	.....	2,000	.....	.....	3,200
Saypo .....	.....	.....	.....	700	.....	.....	.....	700
Shelby	15,650	500	.....	100	6,700	.....	.....	22,850
Total Teton County	91,150	8,500	30,000	3,300	88,500	.....	.....	221,450

ESTIMATED BUILDING IMPROVEMENTS—Continued.

VALLEY COUNTY.

TOWNS	Private Dwellings, Barns and Other Outbuildings.....	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc.....	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc....	Public Works, Sewers, Lighting and Water Works Plants, Park Im- provements, Etc..	Railroad Build- ings.....	Other Improve- ments Not Class- ified.....	Total
Culbertson	6,500	1,500	.....	.....	.....	2,000	.....	10,000
Glasgow	5,500	.....	.....	.....	500	.....	1,000	7,000
Hinsdale	16,000	.....	.....	10,000	4,000	.....	.....	30,000
Malta	12,000	500	.....	9,000	500	500	.....	22,500
Nashua .....	.....	.....	4,000	.....	.....	.....	.....	4,000
Oswego	5,000	.....	.....	.....	5,000	.....	1,700	11,000
Poplar .....	.....	.....	.....	.....	.....	.....	.....	.....
Wolf Point	2,000	400	.....	.....	200	600	.....	3,200
Total Valley County	47,000	2,400	4,000	19,000	10,200	3,100	2,700	88,400

YELLOWSTONE COUNTY.

Billings	228,900	90,500	12,300	80,000	34,120	5,000	.....	450,820
Columbus	8,000	.....	10,000	.....	.....	.....	.....	18,000
Huntley .....	.....	.....	.....	.....	.....	.....	.....	.....
Laurel	4,000	2,000	.....	.....	6,000	.....	.....	12,000
Musselshell	4,000	.....	5,000	.....	.....	.....	.....	9,000
Total Yellowstone County	244,900	92,500	27,300	80,000	40,120	5,000	.....	489,820

ESTIMATE OF THE VALUE OF BUILDINGS ERECTED AND REPAIRS ON BUILDINGS DURING THE YEAR 1901.
BY COUNTIES.

TOWN	Private Dwellings, Barns and Other Outbuildings	Business Houses, Warehouses, Etc.	Manfg. Plants, Mills, Mine Buildings, Shops, Etc.....	Public Buildings, Such as Schools, Jails, Court Houses, Poor Farms, Churches, Hospitals, Etc...	Public Works— Sewers, Lighting Plants, Water Works and Park Improvements....	Railroad Build- ings	Other Improve- ments Not Class- ified	Total
Beaverhead	60,350	21,250	1,000	58,350	2,500	4,000	2,000	149,450
Broadwater	18,750	2,275	1,750	11,015	325	1,500	300	35,985
Carbon	83,075	15,850	34,000	1,300	500	1,000	600	136,325
Cascade	466,400	202,600	108,000	252,900	106,100	20,600	3,500	1,160,150
Choteau	74,725	67,200	6,000	4,400	11,650	106,500	13,100	285,575
Custer	48,000	6,500	.....	22,000	4,075	50	.....	80,625
Dawson	23,600	33,000	400	1,300	4,900	450	66,000	128,780
Deer Lodge	110,650	2,000	800,000	55,000	.....	.....	575	967,625
Fergus	80,450	28,500	25,500	1,850	7,000	.....	6,080	119,380
Flathead	257,110	99,400	55,000	27,300	43,900	.....	1,250	483,950
Gallatin	83,425	78,900	9,600	6,560	21,650	250	.....	235,385
Granite	1,300	2,600	15,000	2,400	100	300	.....	31,700
Jefferson	24,150	1,950	150,200	40,820	.....	1,670	10,000	220,790
Lewis and Clarke	42,017	51,470	26,000	81,170	140,000	1,450	2,000	343,054
Madison	72,390	25,650	291,300	17,600	4,300	50	957	411,290
Meagher	12,550	1,650	3,000	500	1,400	.....	.....	19,755
Missoula	220,367	54,250	201,000	9,450	.....	.....	685	494,517
Park	80,325	97,450	9,385	6,400	1,695	9,250	.....	400,315
Powell	7,450	5,550	15,500	700	.....	200	.....	29,400
Ravalli	10,200	6,000	250	10,200	.....	.....	.....	26,650
Rosebud	29,580	2,000	.....	1,000	200	.....	.....	49,280
Silver Bow	241,900	554,375	62,000	161,000	41,651	15,000	1,500	1,116,926
Sweet Grass	10,875	3,000	1,700	89	.....	1,500	.....	17,955
Teton	91,150	8,500	30,000	3,300	88,500	.....	.....	221,450
Valley	47,000	2,400	4,000	19,000	10,200	3,100	2,700	88,400
Yellowstone	244,990	92,500	27,300	80,000	40,120	5,000	.....	489,820
Total	2,441,289	1,466,820	1,877,885	876,615	539,856	428,870	111,247	7,742,582

LIBRARIES.

HISTORICAL.

The tabulated statistics of the libraries of the State were prepared by Miss Mary Pew, and the historical data arranged by Miss Stokes, assistants in the State Historical and Miscellaneous Library, under the supervision of Mrs. Laura E. Howey, the librarian.

The pioneers of Montana were men who knew and appreciated the importance of schools and libraries. When they commenced the building of the Territory they also began an effort in behalf of these two avenues of public education, and amid all the discouragements that beset them in the wilderness their energy did not flag nor their faith waver. A more than passing notice should be given to the action of these pioneer law makers of Montana inasmuch as it is a fact that her legislators were the first of the entire western section to recognize by legislative enactment these educating and refining forces in society. So far as we can learn through correspondence and research, none of the Rocky Mountain border states in their first assemblies enacted laws as did Montana, providing for a territorial library, a school library and historical society. In deed, most of them made no provision at all for several years after their organization as territories.

From page 433 to 443 of the Bannack laws passed by the First Legislative Assembly, is found "An act establishing a common school system for the Territory of Montana," of which Section 14 of Chapter 5 provides for the purchase of a school library. A close perusal of the 10 pages will convince any one of the high type of patriotic, scholarly citizen these men were, and their desire to lay well the foundations of our young Commonwealth is proven by this action.

The same volume of the Bannack laws provides for the foundation of our State Law and Miscellaneous Library, as is shown on page 453 under Section 6 of duties of the auditor, which makes him ex-officio librarian, whose duty it is to care for and provide all needful maps, books, etc., for Territorial officers.

This first legislature also passed "An act to incorporate the Historical Society," out of which has grown our excellent Historical Department of the State library.

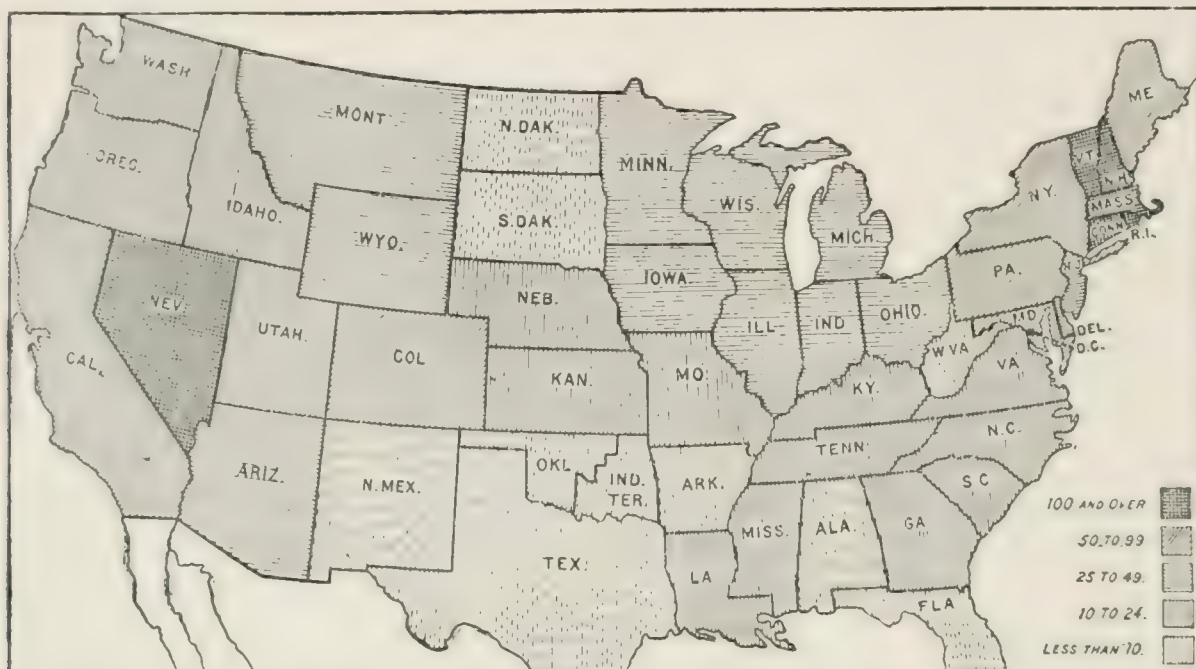
These important steps taken when the Territory was only six months old, indicate plainly the class of citizens at the helm in public affairs. The Territorial library remained at Virginia City until the capital was removed to Helena in 1874, when it, of course, was moved there also, and the Historical Society with its library, as its incorporators and supporters were all coming to Helena to reside.

The Law and Miscellaneous library grew rapidly and was cared for under one head until 1881. A wise provision was made that year for three divisions of the library, and the law department was cared for by the Clerk of

the Supreme Court, and the Miscellaneous and Historical department given to another librarian in a separate building. This bill, which became a law, was drawn up by our present governor, who was president of the council of the session.

In 1886 or '87, when the state officers moved into the Lewis and Clarke county court house, the library was all thrown together and placed in charge of Miss Lou Guthrie. In 1890 the Historical Society gave to the State its valuable and rare collection of books, maps, papers, curios, etc., on certain conditions, one of which is that its volumes of contributions shall be published regularly.

The interest in library work in the State has steadily increased until to-day we are in the lead of the entire western section of states, with a fine



LIBRARY MAP OF THE UNITED STATES SHOWING THE NUMBER OF VOLUMES TO EACH 100 POPULATION IN 1896

State library, about 17 free public libraries, and nearly 30 office and institutional libraries, comprising a grand total of 187,589 books, magazines, papers and pamphlets, besides a large number of which we have no report. Nor does this include school libraries, which add 40,000 more, as appears in the Superintendent of Public Instruction's biennial report. This gives a total of 227,589.

The accompanying library map of the United States shows the number of volumes to each 100 population in 1896, and places Montana in the class with Iowa, the Lake states and New Jersey, and far ahead of Oregon, Washington and Idaho; while the Dakotas rank lowest of these states.

"The pioneer lawmakers builded better than they knew." Not only have the libraries become more numerous, but the beautiful buildings are increasing rapidly and keeping pace with lines of progress in other directions. The librarians also are marching abreast of the times and seeking the best training possible for their posts of duty.

HELENA.

Helena, a newer town than either Bannack or Virginia City, had a private library well started in 1868, and conducted by membership, donations and

entertainments until 1883, when a law was passed granting incorporated towns the privilege of voting a tax for the support of libraries. (See pages 110-111, Section 1, Laws of 1883.)

The people of Helena took advantage of this wise provision, and in 1886 the Helena library became a free public library, supported by this tax. It started fairly well equipped with the nucleus already gathered by the private corporation, which was given to the city at once. Helena has therefore the honor of opening the first public library in the Territory, and, it seems, the first one in the Northwest. The report of the librarian is appended:

Helena Public Library.

In 1886 the city of Helena voted to maintain a free public library, and the revenue from a tax of one-half mill on the dollar was set apart for the purpose. The Helena Library Association, organized in the autumn of 1868, gave as a nucleus its collection of about 2,000 volumes. From year to year the library grew, and in 1892, the city erected a \$10,000 building in connection with its auditorium. The library was given the main floor, and in August, 1892, it was moved into its new quarters. The rapid growth of the institution in a short time made plans for enlargement necessary, and in the spring of 1897, the basement of the building was fitted up for the loan department and workroom, leaving the main floor for the reading room and reference department, the consulting room and office. Since that enlargement, the institution has grown in popular favor until again there is need for more room and greater facilities.

The library aims at a high ideal, and has striven to be an educational force in the community. While an effort has been made to establish educational lectures as a feature of its work, and the needs of the various study clubs have received careful attention, the work for the children has been especially emphasized, and although the revenue of the institution has not permitted the maintenance of a junior department such as is found in so many of the prominent libraries of the country, the necessity for effort along that line has been fully realized, and every opportunity has been grasped to push forward this work. One end of the loan department has been set aside for the children and young people. The best juvenile books of the library, a selection of about 3,000 volumes, and the popular juvenile periodicals are collected there. About 200 choice books for the very little people are placed on shelves by themselves, and among all the library's patrons it would be difficult to find those more appreciative than the little folk. Care is taken that the young people may be directed to the best books, and that they may be aided in their search for matter relating to their school work.

The importance of co-operation with the public schools is never lost sight of. A special endeavor is made to aid teachers in their quest of material for school-room work.

A good reference collection of books upon psychology, pedagogy, and the history of education, is kept in the consulting room for the use of teachers who go there for study.

The library has about 32,500 volumes. Over 10,000 volumes of the best books of the loan department are kept on open shelves. The reading-room contains about 2,000 reference books and bound magazines, while the reference department numbers altogether over 10,000 volumes. Over 500 current periodicals are found in the reading-room. A large number of visits are made annually to this room, which is open 13 1-2 hours a day. The loans for home use in 1901 were 75,132 volumes. The loans to young people were 40 per cent of the total loans, while their books were only 17 per cent of the entire library.

The revenue for the library's support is derived from a city tax of 3-4 mill on the dollar, which yields annually about \$7,300. A board of seven trustees manages the affairs of the institution.

DEER LODGE.

In 1879 the Collegiate Institute of Deer Lodge was opened, and gathered about the best collection of government documents in the State outside of the State Library. This library is now closed. Through the generosity of one of our pioneer citizens Deer Lodge will have a fine \$30,000 building, the gift of Hon. Conrad Kohrs to his home town. This elegant structure, built as a memorial to his son, is to be complete in modern improvements and well filled with shelves of the best literature, to be presided over by Miss Catlin, a Deer Lodge young lady. It is to be ardently hoped that other wealthy citizens of Montana will profit by Mr. Kohrs' good example and give to Livingston, Lewistown, White Sulphur Springs, Virginia City, Benton and other towns that are now struggling along supported by small tax, private subscriptions and entertainments. The following description was given in a recent paper:

"The building is designed in the Greek Ionic order. All outside walls are built of cut stone. The roof is covered with glazed terra cotta tile, and all floors, ceilings and walls are built of iron and concrete, making the entire building thoroughly fire-proof.

"Access is had to the main or library floor by a broad flight of stone steps under an Ionic portico, landing in a vestibule of marble, with niches for statuary on each side. Through a wide oak doorway entrance is had to the Memorial Hall, which is decorated with marble wainscoting, Ionic pilasters on either side, and a Mosaic tile floor. From this hall we enter the reading room, which is a large and well lighted, airy room, the delivery desk for books being directly in front, and is so located that the librarian has complete control of the entire room, as well as the book room. In the front and connected with the large reading room, is the children's reading room on one side and the librarian's office on the other. On one side, in the rear, is a ladies' cloak room and toilet room, while on the other side is the librarian's work room and stairway to the basement. Directly in the rear of the delivery desk is the book room, which is furnished with iron book cases and at present arranged to accommodate 10,000 volumes.

"The basement is divided into a large lecture room, with two parlors in connection. There is also a men's toilet room, boiler room and coal room, and unpacking room in the rear of the basement. The building is to be heated by hot water and warm air, and is so ventilated that an entire fresh supply of air is drawn into every part of the structure every 15 minutes.

"The wood work on the inside is all oak, and the walls will receive a rich tint agreeable to the eye, being relieved by artistic frescoes. All the materials used are first-class, and the contractors, under the direction of the architect, are doing first-class work.

BUTTE.

In 1890 the citizens of Butte offered a book fund of \$22,000 if the city would give a suitable building and support to the library. \$10,000 of this book fund was given by Mr. Charles X. Larabee. In 1893 a handsome building, costing \$100,000, was ready and elegantly furnished for occupancy.

GREAT FALLS.

Great Falls has had a good library building for years. It was built by

Hon. Paris Gibson, in memory of his wife. The town has grown so that the library needed larger quarters and Carnegie is helping it out.

MISSOULA.

The citizens of Missoula gave a small collection of books as a beginning, and in 1894 the present library was founded. It has no building of its own.



PUBLIC LIBRARY, DILLON

ANACONDA.

Anaconda has a beautiful library building erected by Mrs. Phoebe A. Hearst as a memorial to her husband, the late Senator Hearst, of California. The library was founded in 1895 and occupied temporary quarters until the present edifice was opened for use in 1898. The cost of erection was \$60,000. It is of granite and pressed brick, finished inside with beautiful white oak, the walls and ceilings pleasingly colored. On the main floor are the reading room and loan department. On the second floor are the reference department and meeting and club rooms. Two librarians are employed.

DILLON.

The Dillon Public Library, starting as a reading circle with an annual fee of \$5 a member, became a free library in 1888, supported by city tax. The

use of the library and interest in it are growing each year. The new building, given by Andrew Carnegie, is built of white volcanic lava and is exceptionally beautiful.

BILLINGS.

The handsome illustration of the Billings library speaks for itself. The building is an up-to-date affair all through, erected by Frederick Billings, Jr., in memory of his brother, Parmly Billings. The library is presided over by a well trained librarian from Madison Library school, Miss Mable Collins. The report of the librarian follows:

"In March, 1898, S. E. Kilner, trustee of the estate of the late Frederick Billings, suggested to Frederick Billings, Jr., the idea of erecting and presenting to the city of Billings a library building, and dedicating the same to his brother, Parmly Billings, to be known as the Parmly Billings Memorial Library. Parmly Billings was, before his death, largely interested in lands and banking in the city.

"The style of the building is Romanesque, and it is simple yet elegant in architecture. The main material used in its construction is local sandstone taken from the bluffs north of the city, where it is found in such unlimited quantities as would suffice to duplicate every building in Montana and still leave plenty for the next generation. The roof is of Spanish tile and the cornice of copper, giving a permanent and durable character to the exterior, which is expressive of the use to which the building is to be devoted.

"The dimensions of the building are 60 feet front by 44 feet in depth. The basement is 12 feet in height, and is almost entirely above ground, giving abundant light. The heating plant and fuel room are in the rear of the basement, of which the main part will be used for literary meetings and clubs until it shall be needed in the future enlargement of the library. The first principal floor will be for the library proper. The ceiling is 15 feet high with an arched center. This floor has been arranged in accordance with the most modern ideas of public library administration. It is well lighted in every part. There are also rooms for librarian, trustees and janitor. The interior is handsomely frescoed and finished in oak, with maple flooring. It is admirably suited for the purpose of a public library.

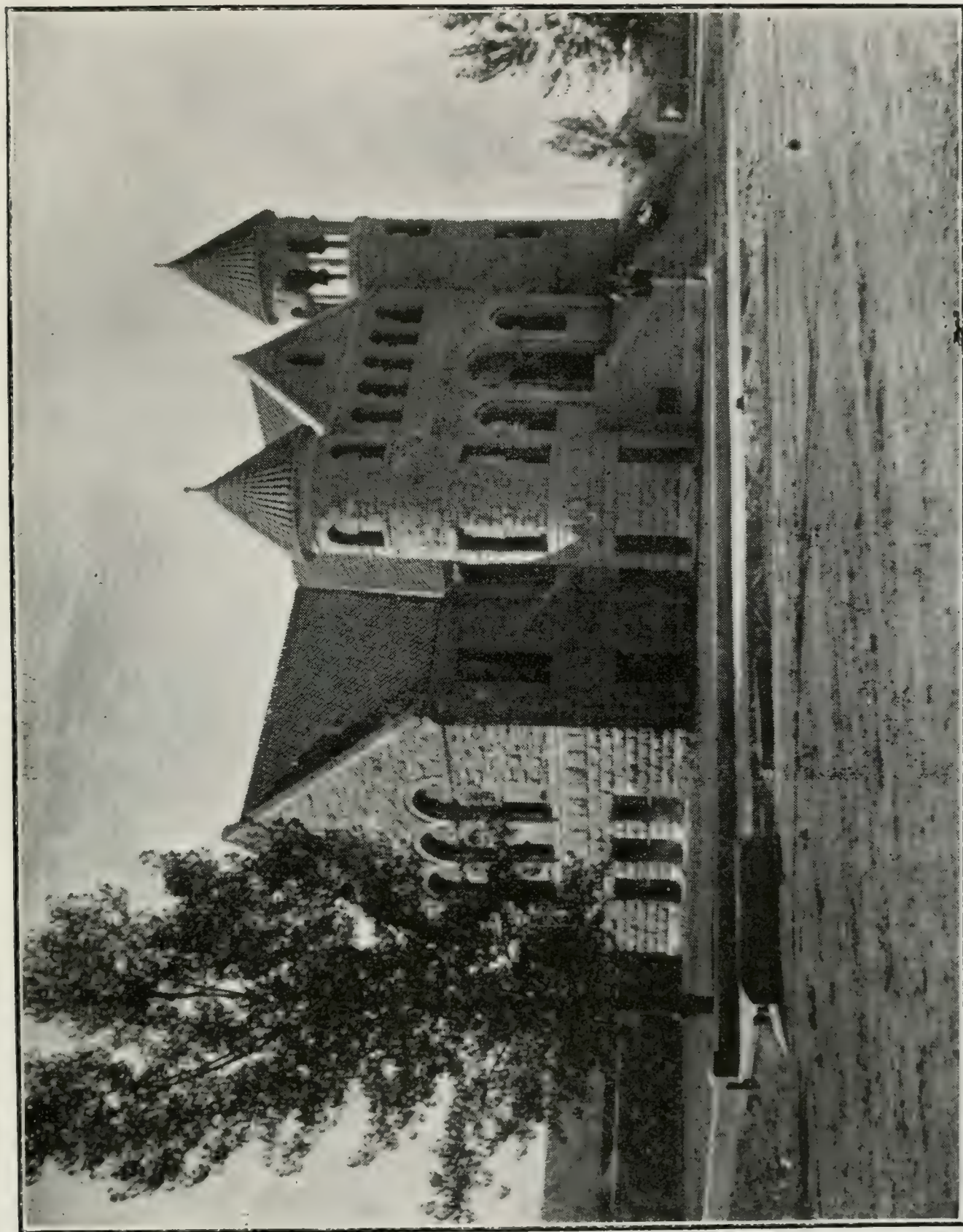
"The citizens promptly fell in with the ideas of the generous donor, and voted a tax of one mill on the dollar of the assessable property of the city for the maintenance of the library, and a liberal amount will be donated from private sources to purchase books. The site is in the very center of the city, and the building stands in one of the pretty little parks on the Northern Pacific right of way, which cuts the town in two. The site was donated by the railway company, which also offered to defray a portion of the expense, but Mr. Billings declined any assistance, and has expended over \$25,000 on the building.

"The dedication and formal opening of the library was October 1, 1901.

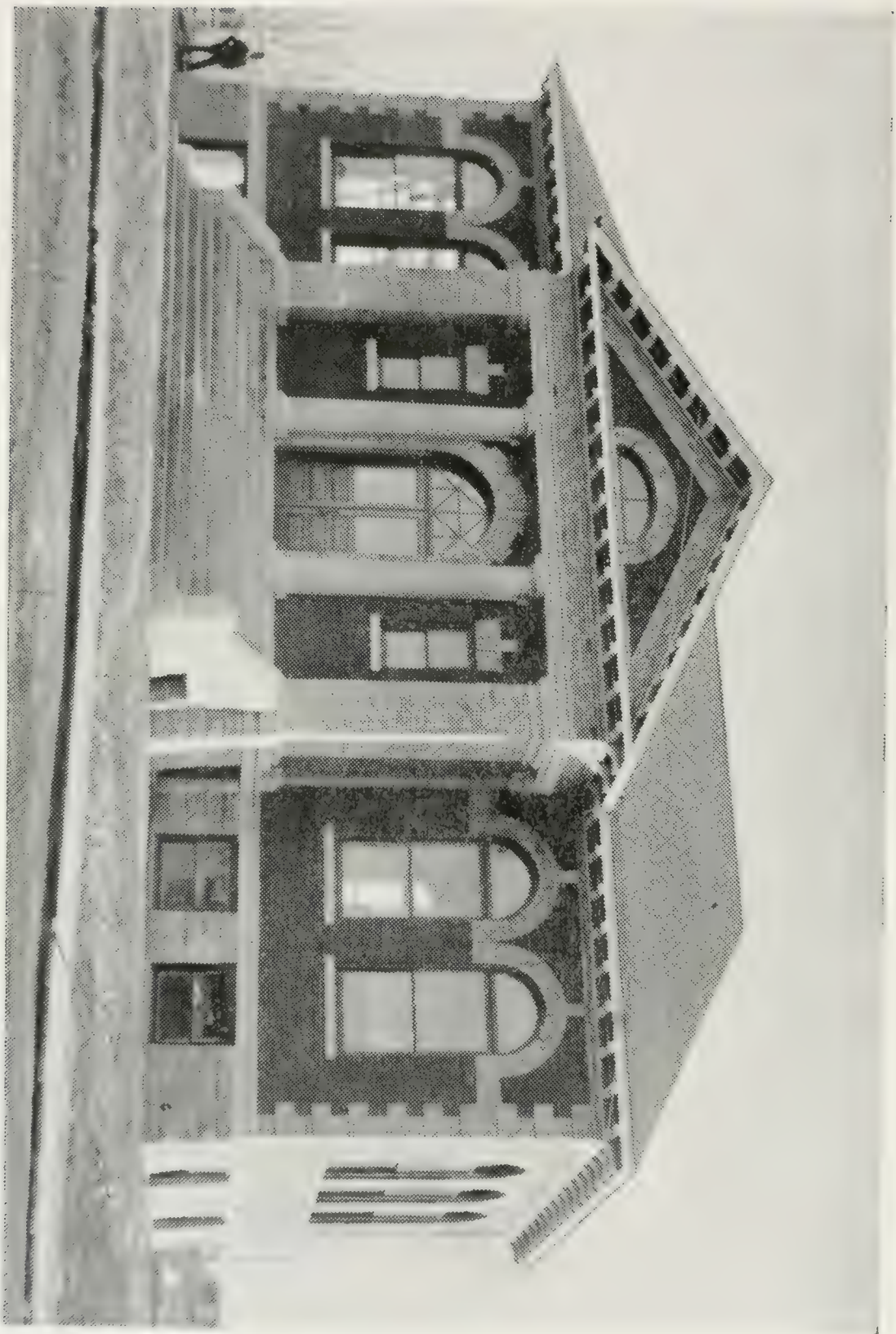
"The Board of Directors consists of A. L. Babcock, J. R. Goss, J. D. Matheson, I. D. O'Donnell, Rev. W. D. Clark, Rev. Francis Van Clarenbeck."

WHY MONTANA'S LIBRARY CONDITION RANKS HIGH.

The library conditions that prevail in Montana to-day are most excellent, for the following reasons: The wise provisions of our laws is placed as first cause of such conditions; second, the hearty co-operation of Superintendent of Public Instruction and county school superintendent in enforcing the section regarding the maintenance of school libraries; third, an intelligent, well-trained corps of librarians; fourth, uninterrupted service of years, terms



PARNLY BILLINGS PUBLIC LIBRARY, BILLINGS



MILES CITY PUBLIC LIBRARY

not marked by political change; fifth, an appreciative, cultured constituency, encouraging the librarians in charge.

THE LIBRARIANS.

It is gratifying to note that our State, following the good example of those states where the best library conditions prevail, has, in most instances, regarded above all other considerations the qualifications of the librarian of first importance. Experience in his profession, a protracted connection with the library and a genuine love of books enhance the value of a librarian's services and make it essential for the best interest of the library that his relation to it should not be interrupted for mere political considerations.

The terms of service in most of our libraries have been cut off in nearly every instance either by death or resignation. No doubt the excellent condition of the Helena library to-day is owing to the long and continued service of its librarians and assistants trained under Mr. Patten in his years of devotion to its interests. The present librarian and one of her assistants have served respectively 10 and 11 years. Mr. Patten, after eight years' service, resigned to take a post graduate course in Harvard. Missoula's librarian has served eight years; the Great Falls librarian five years. The State Law and Miscellaneous Library had one librarian for 18 years.

Each year finds several of our young women on their way to library summer schools to become proficient in the work of cataloguing and classifying books. The State library now has one of Minnesota's summer students employed. The Helena library sent two this last year to the Chataqua library school, and several years ago sent two to Madison, Wisconsin.

The demand for skilled labor has penetrated even the library world, and the trained librarians are called for to-day everywhere. We are happy to report Montana is not found lacking in this requirement. Our librarians are for the most part from Madison, Wisconsin, library school. Helena has two trained in Madison and two in Chataqua library schools; Dillon one trained at Berkeley, California, summer library school; Billings, one at Madison; Great Falls, one who studied a year in the east, the school not reported; Livingston's librarian was trained in the east, school not reported; the State Historical and Miscellaneous department has a librarian at its head trained in Madison, Wisconsin, and by private examinations.

Librarians have not as yet formed an association in Montana, but the librarian in charge of the Historical and Miscellaneous Department of the State Library is a member of the American Library Association and National Association of State Librarians, which is a department of the American Library Association.

The historical sketch prepared by Mr. Patten for the Seventh Annual Report of the Bureau could very appropriately be reproduced except for the lack of room.

The tables given here are incomplete, but the best that could be prepared from the returns made on the blanks sent out nearly a year ago.

STATISTICS OF INSTITUTIONAL AND OFFICE LIBRARIES.

NAME OF LIBRARY	Librarian	Library Founded.....	No. Bound Volumes in Library.....	No. Volumes Added in Year.....	No. Pamph- lets in Library	No. News- papers, M'gs, Etc. Taken..	Hours Open	Expended for Books, Etc...	For Salaries, Etc.....	Total.....
Poudre-Deaf and Dumb School Library	A. T. Schoolfield	.....	600	.....	.....	.....	.....	.....	.....	.....
* Bozeman- Library of State Col. of Agr.	.....	.....	.....	.....	.....	10	.....	.....	.....	.....
Butte-Canadian Institute	R. E. Lemire	1891	2,500	.....	.....	.....	10 15 hours	\$250 00	\$1,200 00	\$1,450 00
* Fire Department Library	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
* Christian Science Library	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
* Medical Ass'n of Montana Library	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
* Miners' Union Library	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
* Pioneer Library (K. of L.)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
* Literary Soc. Freja Library	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mont. Soc. of Engineer's Library	R. R. Vail	July 1887	140	40	1,000	.....	Members all times	75 00	500 00	575 00
* Columbia Falls-Soldiers' Home Library.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boer Lodge-Prison Library	Prisoner	1902	4,000	.....	.....	.....	2 bks p. wk to pris.	.....	.....	.....
Lillon State Normal Library	H. H. Swain	1897	3,455	325	.....	46	8 A. M.-6 P. M.	235 00	144 00	379 00
Helena Fire Department Library	Thos. Kane	.....	.....	.....	.....	.....	.....	.....	.....	.....
Diocesan (Catholic) Library	Rev. Victor Day	.....	.....	.....	.....	.....	.....	.....	.....	.....
Masonic Library	C. Hedges	1888	2,000	.....	.....	.....	.....	.....	.....	.....
Montana Club Library	.....	1866	1,500	.....	5,000	.....	.....	185 00	.....	185 00
Post Library. Fort Harrison	.....	1882	1,500	.....	.....	125	8 A. M.-12 M.	100 00	.....	100 00
St. Vincent's Academy Library	Dr. F. D. Pease	1895	3,000	.....	.....	59	(a)	.....	.....	.....
U. S. Weather Bureau (Office Library)	Sr. M. Syra	1872	1,500	.....	.....	10	.....	50 00	.....	50 00
Sacred Hearts' Library	Section Director	1880	220	.....	.....	25	9 A. M., 4 P. M.	.....	.....	.....
State Supt. Public Inst. Office Library.	Mary E. Derham	1890	2,000	.....	.....	.....	.....	.....	.....	.....
Bureau Agri. Labor & Ind. (Office Libry)	.....	.....	751	.....	.....	.....	.....	.....	.....	.....
Weslyan University Library	Nellie Monk	.....	750	.....	110	.....	9 A. M.-4 P. M.	.....	.....	.....
Miles City-State Reform School Library.	C. B. Dickinson	1890	4,000	.....	.....	12	3-4 P. M.	.....	.....	.....
Missoula-State Univ. Library	M. A. Wilcox	1894	300	.....	.....	.....	.....	.....	.....	.....
* Twin Bridges-Orphans' Home	.....	1895	6,000	.....	.....	93	9 A. M.-4 P. M.	.....	.....	.....
School District Libraries	.....	.....	40,000	.....	.....	.....	.....	.....	.....	.....
Total	.....	.....	74,416	365	6,110	441	.....	\$895 00	\$1,844 00	\$2,739 00

* No report.

(a) 9-11:30 A. M.; 1-4 and 6-9:30 P. M.

STATISTICS OF PUBLIC LIBRARIES.

NAME OF LIBRARY	Librarian	Library founded	No. Bound Vols. in Li- brary	No. Volumes Added in Year.....	No. Pamph- lets in Li- brary.....	No. Newspa- pers, Mags., Etc., Taken..	Hours Open
Anaconda—Hearst Free Library	E. L. Thompson and R. E. Emmons	Mar. 25, 1895	6,369	600	.....	85 (a) .....	.....
Billings (Farmly) Memorial Library	Mabel Collins	1901	2,456	2,456	1,614	140 9 A. M.-9 P. M.	.....
Bozeman Free Library	B. K. Chrisman	1880	6,608	418	.....	3-5; 7-8:30 P. M.	.....
Butte Free Public Library	J. R. Russel	Nov. 1890	28,311	.....	.....	225 9 A. M.-9 P. M.	.....
*Deer Lodge—Kohrs Library .....	.....	.....	.....	.....	.....	.....	.....
Idillon Public Library	M. Lyle Innes	1885	2,438	358	.....	17 4 hrs. per week.	.....
Great Falls—Valeria Public Library	Bella Brown	1892	5,700	380	.....	24 (b) .....	.....
Helena Public Library	Mary C. Gardener	1868	39,500	1,781	16,39	514 (d) 8:30 A. M.-9 P. M.	.....
Kalispell Public Library	F. E. Madison	1897	1,341	214	509	32 2-9 P. M., Sun. 2-5.	.....
** Lewistown Public Library .....	.....	.....	.....	.....	.....	.....	.....
** Lewistown Public Library .....	.....	.....	.....	.....	.....	.....	.....
** Miles City—Public Library .....	.....	.....	.....	.....	.....	.....	.....
Missoula Free Public Library	S. K. Reinhard	Apr. 1894	6,712	.....	2,00	88 2-5; 7-9 P. M.	.....
Montana State Library— *** Hist., and Miscellaneous Dep't.....	L. E. Howey	Dec. 28, 1894	*18,000	1,549	*1,510	128 8:30 A. M.-5 P. M.	.....
Law Department	O. T. Crane .....	.....	*12,000	.....	.....	17 9 A. M.-5 P. M.	.....
Twin Bridges Public Library	M. E. Lott	Apr. 1897	1,942	76	.....	9 2-6 P. M. Sat.	.....
Virginia City Public Library	No one person	Oct. 11, 1902	477	.....	.....	10 (c) .....	.....
Totals .....	.....	.....	122,854	8,432	220,092	1,289	.....

* Approximate estimate.
(a) 10 A. M.—10 P. M. Sun. 2-10 P. M.
(d) Reading room open 8:30 A. M. to 10 P. M.

** Recently organized. No report.
(b) 10:30 A. M. to 10:30 P. M.

*** Data taken from last report.
(c) 7-9 P. M. every other day.

FINANCIAL STATEMENT OF PUBLIC LIBRARIES.

NAME OF LIBRARY	Building Owned	Erected.....	Value of Building...	Fund	How Supported	Rate of Tax.	Total Amt. Received...	Expended for Books, Etc.....	For Salaries, Etc.....	Total Expenditures..
Anaconda—Hearst Free Library ...	Owned by Mrs. P. A. Hearst	1895	\$50,000	Built by Mrs. P. A. Hearst.....	By Mrs. Hearst	.....	.....	.....	.....	.....
Billings (Farmly) Memorial Library Yes.....	.....	1901	\$25,000	Gift from Fred'k Billings, Jr.....	Taxation	1 mill	\$2,595 49	\$1,290 22	\$2,510 93	\$5,801 15
Bozeman Free Library	No.....	.....	.....	.....	Taxation	1 mill	.....	.....	.....	.....
Butte Free Library	Yes.....	1893	\$100,000	City tax	Taxation	1/2 mill	1,000 00	700 00	300 00	1,000 00
Boor Lodge—Kohr's Library .....	.....	.....	30,000	Gift of C. Kohrs.....	Taxation	1 mill	.....	3,450 99	11,000 83	11,400 82
Dillon Public Library	No.....	.....	.....	.....	Taxation	3/4 mill	578 82	400 00	175 00	600 00
Great Falls—Valeria Public Library	Yes.....	1892	\$5,000	City tax	Taxation	3/4 mill	7,009 72	2,469 09	4,505 11	6,974 20
Helena Public Library	Owned by City	1892	\$10,000	.....	Taxation	1 mill	1,065 00	283 00	805 00	1,088 00
Kalispell Public Library	No.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
* Livingston Public Library .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Montana State Library—	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Historical and Miscel. Department	Located in State Capitol	1902	.....	.....	By State.....	.....	23,800 00	150 00	2,967 15	3,167 15
Law Department	Located in State Capitol	1902	.....	.....	By State.....	.....	25,500 00	750 00	1,732 35	2,422 35
* Miles City—Public Library	No.....	.....	.....	.....	Taxation	1 mill	.....	.....	.....	.....
Missoula Free Public Library	No.....	.....	.....	.....	Taxation .....	.....	4,600 00	2,164 20	1,415 75	3,589 95
Twin Bridges Public Library	No.....	.....	.....	.....	Library Ass'n .....	.....	19 15	54 00	63 50	118 50
Virginia City Public Library	No.....	.....	.....	.....	.....	.....	.....	200 00	.....	.....
Totals .....	.....	.....	\$220,000	.....	.....	.....	\$67,268 18	\$12,011 50	\$25,484 62	\$37,282 12

* Recently organized.

Note:—The cities having Carnegie Libraries are Bozeman, Dillon, Miles City, Kalispell and Great Falls.

RAILROAD BUILDING.

Rumors of the extension of transcontinental lines of railroad to and through Montana have been prevalent from time to time during the past two years, but no verification of these rumors has been obtainable beyond the fact that it can be authoritatively stated that at one time within the period it was the serious intention of the Chicago, Milwaukee and St. Paul road to enter Montana territory and a survey was made in this behalf. It was, no doubt, out of this fact that rumor gained currency that Helena was destined to become for a time at least the western terminus of this enterprise. Since the survey was made, however, nothing further has transpired to stimulate the hopes of the public and it is, therefore, concluded that the project has been indefinitely deferred.

As early as 1890 the Burlington & Missouri River Railroad ran a line from Billings to Lombard touching the Crow Creek country and at the same time a line was run to Great Falls and maps of the surveys filed with the United States Surveyor General. During the past two years rumors have been rife at times to the effect that the Burlington was to be immediately extended northward from Billings, and in the spring of 1902 a company was actually organized for the purpose of extension, a re-survey was made between Billings and Great Falls and the line staked, but grading has not begun and nothing definite is known as to the intentions of the company in the matter.

Since January 1, 1900, the Montana Railroad has continued its line eastward from Martinsdale to Harlowton, a distance of 23 miles, and on the 23rd of October, 1902, began active construction work from Harlowton toward Lewistown, 63 miles distant. This work is contracted for completion July 1, 1903. This will give the Montana Railroad a total mileage of 157 miles, and opens up one of the most fertile and prosperous agricultural and stock raising sections of the State.

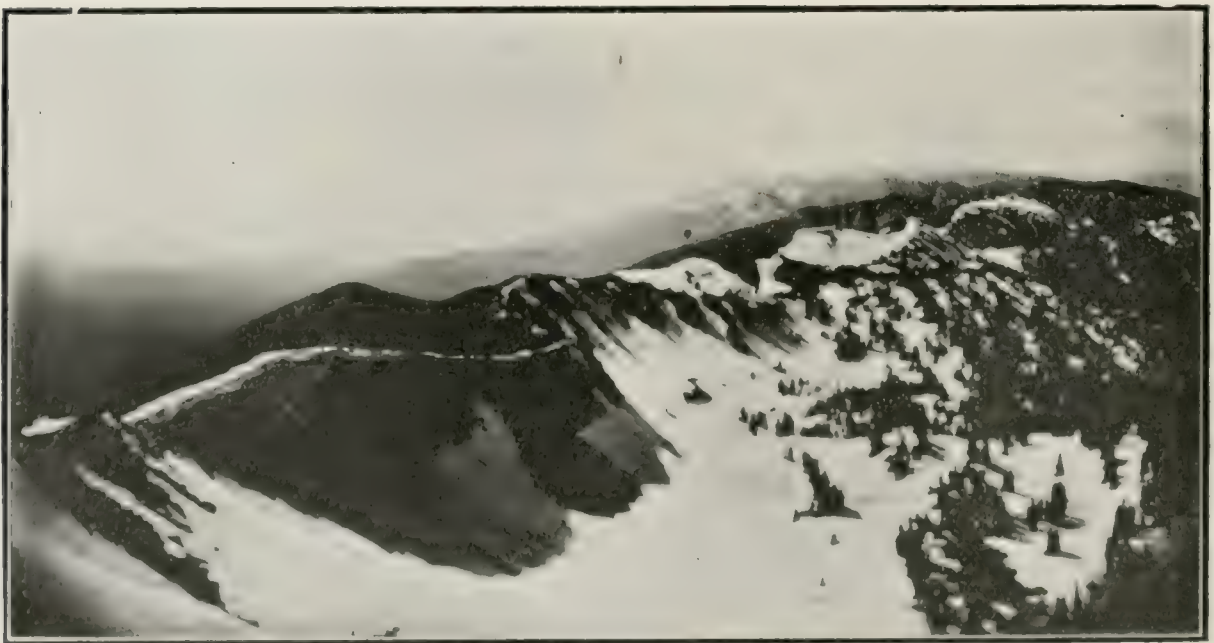
The Gaylord & Ruby Valley Railroad has been extended from Twin Bridges to a point about five miles from Virginia City in Madison county, the terminal station being named Alder. This is in reality an extension of the branch of the Northern Pacific Railway which leaves the main line at Whitehall.

The construction of the Montana & Great Northern road from Jennings, in Flathead county, to the famous Crow's Nest Pass coal fields, a distance of 50.98 miles, which was opened for traffic October 1, 1902, will be of great advantage to all parts of the western and central portions of the State at least, and ultimately necessitate the building of what is commonly known as the Jocko cut-off from Kalispell to Somers at the head of Flathead lake and from there around the north end of the lake to Big Fork at the northeast corner, thence south along the east side of the lake to Polson and across the Flathead Indian reservation to Jocko, where it will connect with the Northern Pacific. In a speech made at Great Falls last summer, President Hill of the

Great Northern promised the construction of this line at the same time saying that so far as he was personally concerned there would be no more new roads built by his company for the present at least. This line will furnish an outlet to the southward for the immense lumber enterprises of Flathead county in addition to the coal mines referred to and open to rail communication one of the most productive and fascinating districts of the State.

In 1901, 55.4 miles were actually constructed and during 1902 144.1 miles were put in operation, making a total of 199.5 miles for the two-year period, besides the undertaking of the Montana Railroad in starting work on its Lewistown extension from Harlowton, some portion of which may be turned over to the operating department by the end of the year.

The foregoing does not take into account the betterment work that has involved the abandonment of old roadbed and the construction of new for the purpose of lessening grades or shortening distances, which class of work has been very great on both the Northern Pacific and Great Northern roads during the past four years; nor the change from narrow to standard guage of the Great Falls & Canada Railroad from Great Falls to Shelby Junction, a distance of 90 miles. These betterment undertakings have required an immense outlay of money and the employment of large forces of men. Thus, while the building of any more trunk lines is entirely problematical, the construction of feeders and branches as well as the straightening and betterment of the old roadbeds is constantly going on thereby vastly improving the transportation facilities of the State. The total main line mileage of all roads in the State July 1, 1902, was 3,131.87. Total length of side tracks, 512.14 miles.



A SUMMER SCENE IN THE MOUNTAINS

TELEPHONES.

"Thoughts that flash midst wires and bells,
O'er craggy peaks and flowery dells."

A glance into the statistics pertaining to the telephone business of the State would seem to indicate that its citizens are great talkers. The topography of Montana is such that expeditious travel is precluded in many instances and modern fast mail service is out of the question on account of the indirection of routes. It is doubtless owing in some measure to this fact, together with the satisfaction that is derived from direct communication, that such strides in line construction and extensions of service have been made during the past year.

It is impossible to assert positively who first introduced telephones into Montana or who were the owners of the first company, but probably the first long-distance line was that from Helena to Deer Lodge, which was put into service in 1882. Prior to 1883 there were a few local companies with a limited number of miles of lines, the most prominent of which was the Montana Telephone Company. On February 14, 1883, representatives of the various lines met and organized what is now known as the Rocky Mountain Bell Telephone Company. With a localization of policy and a firm belief in the future, the lines of poles were pushed out into new territory until to-day the whole State is covered with a net-work of wires. At first the service was circumscribed to localities, but it has gradually spread until the people of many of the smallest villages may talk with those of half a dozen states.

Developments in this branch of industry during the past two years furnish interesting data. The Rocky Mountain Bell Telephone Company, which is the largest concern of its kind now operating in the State, employed during 1901, 97 persons, the monthly pay-roll amounting to \$4,657. To meet the increase of business in 1902 there were added to this number 73 employees, or a total of 170 of which 99 were males and 71 females, and the monthly pay-roll now amounts to \$7,524. If the wires of this company were spliced end on end they would reach from New York to San Francisco and back again. It operates a total of 1,383 miles of line requiring the use of 41,490 poles which carry 6,159 miles of wire. The increase of usage and in the extension of lines during the last year was unprecedented since the formation of the company. In 1902 there were built 103 miles of new line and 662 miles of wire were added to that already in use. 1,253 new instruments were installed, making a total of 4,273 'phones which are distributed among 152 offices in the State. Of these 19 are general exchanges located in the following cities: Anaconda, Bozeman, Billings, Butte, Bridger, Big Timber, Boulder, Deer Lodge, Dillon, Fort Benton, Great Falls, Helena, Livingston, Miles City, Missoula, Philipsburg, Townsend, Twin Bridges and Virginia City.

The capital stock of this company for the states of Montana, Utah, Idaho

and Wyoming is \$2,030,900 and of this amount it is customary among the officials to consider one-fourth as covering the Montana properties. The increase of business enjoyed by this company has been common to all the telephone companies in the State.

The North Montana Telephone Company, whose lines extend northwest from Great Falls toward the Blackfeet Indian Reservation, is one of the independent lines. This company maintains 90 miles of pole line with 120 miles of wire. It has eight exchanges and connects with the Rocky Mountain Company at Great Falls. The capital stock of \$10,000 is held entirely in Montana.

The Lewistown and Great Falls Telephone and Telegraph Company, connecting these two cities, operate on the toll system only. It has a single ground line of 170 miles in length with 16 stations connected. The greater part of this \$10,000 capital stock is held in the State.

The Lewistown Telephone Company, conducting a general toll and exchange business in that place, has 105 subscribers and is connected with 100 miles of its own toll lines, as well as with the Great Falls and Lewistown, Rocky Mountain and Castle Mountain lines. The capital stock is \$25,000.

The Lewistown and Grass Range Telephone Company is incorporated for \$10,000 but to date only \$3,000 worth of stock has been issued, all to Lewistown people. This company has 40 miles of toll lines and furnishes connections to six stations.

Connecting Townsend with White Sulphur Springs and Lewistown is the Castle Mountain Telephone Company which is incorporated for \$25,000, the stock having a par value of 50 cents a share, all of which is owned in Montana. It maintains a single-wire pole line 85 miles in length and affords connection with five stations as well as with the Rocky Mountain Bell Telephone lines.

The Yellowstone Park Telephone Company has 61 miles of pole line reaching from Livingston south to the border of the Park and connecting 18 stations.

The Custer County Telephone Company has 175 miles of line in Custer and Rosebud counties connecting 12 stations with Miles City. It is incorporated for \$20,000 and most of the stock is owned by Custer County people.

The independent exchange at Billings has about 65 subscribers although their lines are but partially constructed. This company is operated in opposition to the Rocky Mountain Bell Telephone Company at that point.

POPULATION OF MONTANA.

ENUMERATION CLASSIFIED.

Population by Sex, General Nativity, and Color: 1900.

Number of male persons in Montana, 149,842; females 93,487. Native born, 176,262; foreign born, 67,067. Total white, 226,283. Native white persons born of native parents, 92,937; of foreign parents, 70,973. Foreign white, 62,373. Total of colored persons,

TABLE 4.—NATIVE AND FOREIGN BORN AND WHITE AND COLORED POPULATION, CLASSIFIED BY SEX, BY COUNTIES: 1900.

Note.—The designation "native white, native parents," comprehends all native white persons having either both parents native born, one parent native born and one parent unknown, or both parents unknown, while the designation "native white, foreign parents," comprehends all native white persons having either one or both parents foreign born. The designation "illiterate" comprehends all persons who can neither read or write, or who can read but not write.)

COUNTIES	Native Born		Foreign Born		Native White Native Par- ents		Native White Foreign Par- ents		Foreign White		Total Colored		Negro	
	Males..	Females.	Males..	Females.	Males...	Females.	Males...	Females.	Males...	Females.	Males...	Females.	Males...	Females.
Beaverhead	2,589	1,776	968	282	1,725	1,123	857	646	807	282	168	7	5	7
Broadwater	1,250	845	411	135	784	512	460	323	396	135	21	10	6	10
Carbon	3,340	2,481	1,151	561	2,173	1,576	1,155	897	1,123	561	40	8	3	1
Cascade	10,115	7,446	5,539	2,677	5,115	3,492	4,717	3,647	5,502	2,670	320	314	86	76
Choteau	4,945	2,506	2,983	532	2,524	1,030	1,675	792	2,201	445	1,528	771	107	49
Custer	3,870	2,800	857	364	2,185	1,351	1,019	713	838	364	685	736	31	17
Dawson	1,148	792	348	155	721	461	425	328	346	155	4	3	2	2
Deer Lodge	6,714	4,755	4,182	1,742	3,318	2,113	3,287	2,581	3,984	1,735	307	68	107	64
Fergus	3,416	2,086	1,063	372	2,219	1,300	1,031	656	986	336	243	166	13	17
Flathead	4,242	2,908	1,619	606	2,654	1,768	1,548	1,112	1,269	603	390	31	24	12
Gallatin	4,457	3,750	901	445	3,394	2,876	1,044	855	851	442	69	22	16	19
Granite	1,704	1,252	924	378	821	576	877	671	932	376	68	7	.....	4
Jefferson	2,109	1,407	1,524	290	1,272	858	826	544	1,468	290	67	5	10	5
Lewis and Clarke	7,408	6,305	3,548	1,910	3,945	3,058	3,242	3,105	3,176	1,892	593	160	194	119
Madison	3,865	2,569	940	321	2,669	1,762	1,176	793	865	319	95	16	17	11
Meagher	1,233	637	505	151	807	416	411	210	498	151	22	11	13	11
Missoula	5,862	4,496	2,733	873	2,932	2,141	1,978	1,502	2,107	842	1,578	884	44	10
Park	3,169	2,069	1,571	532	1,990	1,214	1,164	851	1,212	530	374	6	11	4
Ravalli	3,828	2,878	825	291	2,848	2,206	959	662	766	289	80	12	13	4
Silver Bow	16,825	13,131	11,699	5,980	6,691	4,634	9,975	8,373	11,262	5,970	596	134	141	121
Sweet Grass	1,413	948	548	177	893	563	486	348	526	170	56	44	5	3
Teton	2,453	1,628	807	192	961	369	528	268	683	142	1,108	1,041	4	2
Valley	2,003	1,457	711	184	735	369	473	238	362	146	1,214	888	2	.....
Yellowstone	3,100	2,032	775	305	2,150	1,387	885	597	679	303	161	50	64	43
Crow Reservations.....	1,188	1,062	394	16	135	71	91	42	390	16	916	949	4	.....
Montana	102,246	74,016	47,596	19,471	55,711	37,226	40,219	39,754	43,209	19,164	10,703	6,343	912	611

1 Persons of negro descent, Chinese, Japanese and Indians.

2 Includes all persons of negro descent.

3 Indian reservation.

Note.—No. of Chinese in Montana, 1,760 males, and 39 females; No. of Japanese in Montana, 2,434 males, and 7 females; No. of Indians in Montana, 5,657 males, and 5,686 females.

17,046. Negroes, including all persons of negro descent, 1,523; Chinese, 1,739; Japanese, 2,441; Indians taxed, 597; Indians not taxed, 10,746.

Native and Foreign Born and White and Colored Population, Classified by Sex, 1900.

Native born males, 102,246; females, 74,016. Foreign born males, 47,596; females, 19,471. Total white males, 139,139; total white females, 87,144. Native white males, 95,930; native white females, 67,980. Native white, native parents, males, 55,711; females, 37,226. Native white, foreign parents, males, 40,219; females, 30,754. Foreign white, males, 43,209; females, 19,164. Total colored, including persons of negro descent, Chinese, Japanese and Indians, male, 10,703; female, 6,343.

Negro, Chinese, Japanese and Indian Population, Classified by Sex, 1900.

Negroes, including all persons of negro descent, males, 912; females, 611. Chinese, males, 1,700; females, 39. Japanese, males, 2,434; females, 7. Indians, males, 5,657; females, 5,686.

PERCENTAGES.

The percentage of males to the total population of Montana in 1900 was 61.6; females, 38.4.

The percentage of native born to the total population in 1900 was 72.4; foreign born, 27.6. In the consideration of the native and foreign born elements of the population in 1900 it should be borne in mind that in taking the census for that year Indians and other persons on Indian reservations are included in the statement of population, which was not the case in preceding census periods. The inclusion of this element affects the percentage of native and foreign born in Montana, which is almost wholly native born, and constitutes 4.7 per cent of the total population.

The percentage of white persons to the total population in 1900 was 93.0; colored, including persons of negro descent, Chinese, Japanese and Indians, 7.0 per cent.

The percentage of native and foreign white persons to the total population in 1900 was: Native parents, 38.2 per cent; foreign parents, 29.2 per cent; foreign white, 25.6 per cent; total, 93.0 per cent.

VOTING AGES.

Males of Voting Age, by General Nativity and Color, 1900.

Aggregate for the state, 101,931. Native born, 58,237; foreign born, 43,694. Total white, 94,873. Total native white, 54,890; native white parents, 35,130; foreign white parents, 19,760. Foreign white, 39,983. Total colored, including persons of negro descent, Chinese, Japanese and Indians, 7,058; negroes, including persons of negro descent, 711.

Total Males 21 Years of Age and Over, Classified by General Nativity and Literacy, 1900.

Total persons 21 years of age and over, 101,931; literate, 96,031; illiterate, 5,900. Total native born, 58,237. Literate, 55,961; illiterate, 2,276. Total foreign born, 43,694; literate, 40,070; illiterate, 3,624.

Total Males 21 Years of Age and Over, Classified by General Nativity, Color and Literacy, 1900.

Total white males 21 years of age and over, 94,873; literate, 91,775; illiterate, 3,098. Total native white, 54,890; literate, 54,467; illiterate, 423. Total native white, native parents, 35,130; literate, 34,893; illiterate, 237. Native white, foreign parents, 19,760; literate, 19,574; illiterate, 186. Total foreign white, 39,983; literate, 37,308; illiterate, 2,675. Total colored, including persons of negro descent, Chinese, Japanese and Indians, 7,058; literate, 4,256; illiterate, 2,802.

Colored Males 21 Years of Age and Over in Detail, Classified by Literacy, 1900.

Total negroes 21 years of age and over, including persons of negro descent, in the state, 711; literate, 637; illiterate, 74. Total Chinese 21 years of age and over, 1,653; literate, 1,308; illiterate, 345. Total Japanese 21 years of age and over, 1,824; literate, 1,406; illiterate, 418. Total Indians 21 years of age and over, 2,870; literate, 905; illiterate, 1,965.

SCHOOL AGES.

Persons of School Age, 5 to 20 Years, Inclusive, by General Nativity and Color, 1900.

Aggregate for the state, 65,871. Native born, 59,522; foreign born, 6,349. Total

white, 61,032. Total native white, 55,405; native parents, 28,521; foreign parents, 26,884. Foreign white, 5,627. Total colored, including persons of negro descent, Chinese, Japanese and Indians, 4,839; negroes, including all persons of negro descent, 289.

Males of School Age, 5 to 20 Years, Inclusive, by General Nativity and Color, 1900.

Aggregate for the state, 34,263. Native born, 30,548; foreign born, 3,715. Total white, 31,501. Total native white, 28,452; native white parents, 14,822; foreign white parents, 13,630. Foreign white, 3,049. Total colored, including persons of negro descent, Chinese, Japanese and Indians, 2,762; negroes, including persons of negro descent, 149.

Females of School Age, 5 to 20 Years, Inclusive, by General Nativity and Color, 1900.

Aggregate for the state, 31,608. Native born, 28,974; foreign born, 2,634. Total white, 29,531. Total native white, 26,953; native white parents, 13,699; foreign white parents, 13,254. Foreign white, 2,578. Total colored, including persons of negro descent, Chinese, Japanese and Indians, 2,077; negroes, including persons of negro descent, 140.

MILITIA AGES.

Males of Militia Age, by General Nativity and Color, 1900.

Aggregate for the state, 83,574. Native born, 49,533; foreign born, 34,041. Total white, 77,798. Total native white, 46,912; native white parents, 28,454; foreign white parents, 18,458. Foreign white, 30,886. Total colored, including persons of negro descent, Chinese, Japanese and Indians, 5,776; negroes, including persons of negro descent, 557.

FOREIGN BORN.

Foreign Born Males 21 Years of Age and Over, Classified According to Citizenship and Literacy, 1900.

Aggregate for the state, 43,694. Total naturalized, 26,335; literate, 25,049; illiterate, 1,286. Total first naturalization papers filed, 4,035; literate, 3,764; illiterate, 271. Total aliens, 8,045; literate, 6,698; illiterate, 1,347. Total unknown, 5,279; literate, 4,559; illiterate, 720.

PERCENTAGES.

The percentage of native and foreign born of total persons of school age, 5 to 20 years, inclusive, was native born, 90.4 per cent; foreign born, 9.6 per cent.

The percentage of native and foreign white and colored to total persons of school age, 5 to 20 years, inclusive, was: Native white of native parents, 43.3 per cent; native white of foreign parents, 40.8 per cent. Foreign white, 8.6 per cent; colored, including persons of negro descent, Chinese, Japanese and Indians, 7.3 per cent.

The percentage of native and foreign born to total males of militia age, 18 to 44 years were: Native born, 59.3 per cent; foreign born, 40.7 per cent.

The males of militia age are further distributed, by percentages, according to general nativity and color as follows: Native white, native parents, 34.0 per cent; native white, foreign parents, 22.1 per cent. Foreign white, 37.0 per cent. Colored, including persons of negro descent, Chinese, Japanese and Indians, 6.9 per cent.

The percentage of native and foreign born to total males of voting age were: Native born, 57.1; foreign born, 42.9 per cent.

The percentage of native and foreign white and colored to total males of voting age were: Native white, native parents, 34.5 per cent; native white, foreign parents, 19.4 per cent. Foreign white, 39.2 per cent. Colored, including persons of negro descent, Chinese, Japanese and Indians, 6.9 per cent.

The percentage of literate and illiterate native and foreign born males of voting age were: Aggregate literate, 94.2 per cent, aggregate illiterate, 5.8 per cent. Native born literate, 96.1 per cent; illiterate, 3.9 per cent. Foreign born, literate, 91.7 per cent; illiterate, 8.3 per cent.

The percentage of literate and illiterate native and foreign white and colored males of voting age were: Native white, native parents, literate, 99.3 per cent; native white, native parents, illiterate, .7 per cent. Native white, foreign parents, literate, 99.1 per cent; illiterate, .9 per cent. Foreign white, literate, 93.3 per cent; illiterate, 6.7 per

cent. Colored, including persons of negro descent, Chinese, Japanese and Indians, literate, 60.3 per cent; illiterate, 39.7 per cent.

The percentage of literate and illiterate colored males of voting age, in detail, were: Negroes, including persons of negro descent, Chinese, Japanese and Indians, literate, 89.6 per cent; illiterate, 10.4 per cent. Chinese, literate, 79.1 per cent; illiterate, 20.9 per cent. Japanese, literate, 77.1 per cent; illiterate, 22.9 per cent. Indians, literate, 31.5 per cent; illiterate, 68.5 per cent.

The percentage of foreign born males, of voting age, distributed according to citizenship, were: Naturalized, 60.3 per cent; first naturalization papers filed, 9.2 per cent; aliens, 18.4 per cent; unknown, 12.1 per cent.

The percentage of literate and illiterate foreign born males of voting age, in detail, according to citizen ship were: Naturalized, literate, 95.1 per cent; illiterate, 4.9 per cent. First naturalization papers filed, literate, 93.3 per cent; illiterate, 6.7 per cent. Aliens, literate, 83.3 per cent; illiterate, 16.7 per cent. Unknown, literate, 86.4 per cent; illiterate, 13.6 per cent.

DEATHS.

Table Showing the Number of Deaths in Montana During the Year 1900, as Reported by the U. S. Census Office.

Total number of deaths of males during 1900.....			1,387
Total number of deaths of females during 1900			891
Total number of deaths in the State during 1900			2,188
	Males.	Females.	
From causes unknown	53	48	101
GENERAL DISEASES, CLASS A:—			
Measles	8	9	
Scarlet fever	13	13	
Diphtheria	5	19	
Whooping cough	9	10	
Malarial fever	4	1	
Influenza	10	7	
Typhoid fever	29	13	
Cholera morbus	14	10	
Colitis .....	....	1	
Diarrhoea	9	11	
Dysentery	2	2	
Enteritis	7	5	
Cholera infantum	22	25	
Fever	2	....
Cerebral-spinal fever	13	9	
Smallpox....	3	1	
Erysipelas	2	2	
Septicemia	8	19	
Veneral diseases	4	....
Other diseases of this group	2	3	
Total, General Diseases, Class A.....	166	160	326
GENERAL DISEASES, CLASS B:—			
Alcoholism	22	6	
Lead poison	1	1	
Other poisons	12	7	
Inanition	11	6	
Total General Diseases, Class B.....	46	20	66
GENERAL DISEASES, CLASS C:—			
Old age	21	15	
Premature birth	16	11	
Malformation	1	1	
Debility and atrophy	19	13	
Others of this group	4	....
Total, General Disease, Class C.....	61	40	101

GENERAL DISEASES CLASS D:—

Anemia .....	....	1	
Diabetes	8	4	
Rheumatism	8	3	
Scrofula and tabes	1	4	
Hydrocephalus	3	....
Tuberculosis, general	2	....
Consumption	97	67	
Cancer	25	30	
Tumor	3	3	
Dropsy	14	7	
Others of this group	2	....
Total, General Diseases, Class D.....	163	119	282

DISEASES OF THE NERVOUS SYSTEM:—

Inflammation of the brain	14	3	
Meningitis	21	22	
Apoplexy	24	13	
Paralysis	17	10	
Paralysis, general (of insane)	1	....
Tetanus and trismus nascentium	1	....
Chorea .....	....	....
Epilepsy	6	5	
Convulsions	17	5	
Mental diseases	17	3	
Diseases of the brain	22	4	
Diseases of the spinal cord .....	....	....
Locomotor ataxia	2	....
Others of this class	3	1	
Total deaths from diseases of the nervous system .. .	145	66	211

DISEASES OF THE CIRCULATORY SYSTEM:—

Pericarditis	1	....
Diseases of the heart ..	68	44	
Angina pectoris	1	1	
Diseases of the arteries	2	....
Aneurism	2	....
Embolism	1	....
Others of this class	1	1	
Total deaths from Diseases of the Circulatory System.	76	46	122

DISEASES OF THE RESPIRATORY SYSTEM:—

Croup	11	16	
Pneumonia	302	105	
Laryngitis	1	....
Bronchitis	19	15	
Pleurisy	2	3	
Asthma	5	4	
Others of this class ..	8	2	
Total deaths from Diseases of the Respiratory Sys-			
tem.....	348	145	493

DISEASES OF THE DIGESTIVE SYSTEM:—

Dentition	2	3	
Angina	1	1	
Gastritis	6	9	
Diseases of the stomach	4	7	
Obstruction of the bowels	6	4	
Appendicitis	6	8	
Hernia	6	2	
Other diseases of the bowels	5	2	
Jaundice	1	....
Inflammation and abscess of the liver....	5	2	
Other diseases of the liver	5	....
Peritonitis	8	14	
Ascites	1	3	
Others of this class	7	2	
Total deaths from Diseases of the Digestive System	63	57	120

DISEASES OF THE URINARY SYSTEM AND MALE ORGANS OF GENERATION:—

Bright's Disease	35	12	
Calculus, urinary ....	....	....
Diseases of the kidneys	7	....
Diseases of the bladder.....	1	....
Others of this class	3	3	
Total deaths from Diseases of the Urinary System			
and Male Organs of Generation.....	46	15	61

DISEASES OF THE FEMALE ORGANS OF GENERATION:—			
Ovarian tumors	1		
Diseases of the tubes	1		
Uterine diseases	1		
Others of this class	3		
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Total deaths from Diseases of Female Organs of Generation	6	6	
AFFECTIONS CONNECTED WITH PREGNANCY:—			
Abortion	2		
Childbirth	16		
Puerpal septicemia	10		
Extra-uterine pregnancy	2		
Others of this class	3		
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Total deaths from Affections Connected with Pregnancy	33	33	
DISEASES OF THE BONES AND JOINTS:—			
Diseases of the spine	1	1	
Diseases of the bones	1	1	
Disease of the hip-joint	1	....
<hr/>			
Total deaths from Diseases of the bones and joints..	2	2	4
DISEASES OF THE SKIN:—			
Abscess	4	2	
Others of this class.....	1	....
<hr/>			
Total deaths from Diseases of the Skin	5	2	7
DISEASES OF THE ABSORBENT SYSTEM:—			
Addison's Disease	
Diseases of the spleen	
Others of this class	1	1	
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Total deaths from Diseases of the Absorbent System	1	1	1
ACCIDENTS AND INJURIES:—			
Burns and scalds	6	5	
Drowning	12	2	
Exposure and neglect	4	1	
Gunshot wounds	16	2	
Homicide	13	4	
Infanticide .....	....	....
Injuries by machinery..	....	....
Railroad accidents	23	....
Suffocation	1	1	
Suicide by shooting	6	1	
Suicide by drowning .....	....	....
Suicide by poison	3	5	
Other suicides	14	3	
Sunstroke	1	
Surgical operations	7	
Wounds	1	
Others of this class	113	10	
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Total deaths from Accidents and Injuries..	213	41	254

CLIMATOLOGICAL DATA FOR THE YEAR 1902—Continued.

STATIONS	COUNTIES	Elevation, Feet.....	Length of Record, Years.....	TEMPERATURE IN DEGREES FAHRENHEIT				PRECIPITATION IN INCHES				Prevailing Direction of Wind.....								
				Mean.....	Highest.....	Date.....	Lowest.....	Date.....	Length of Record, Years.....	Total for the Year.....	Greatest Monthly.....		Month.....	Least Monthly.....	Month.....	Total Snowfall.....	Number Rainy Days.....	Number Clear Days.....	Number P'tly Cld'y Days.	Number Cloudy Days.....
Kipp.....	Teton.....	4,149	9	.....	86 Aug.	27	-30	Jan.	25	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lowestown.....	Fergus.....	4,292	5	.....	90 July	31	-28	Jan.	25	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Livingston.....	Park.....	4,650	7	.....	99 June	10	-21	Jan.	25	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Manhattan.....	Gallatin.....	4,292	8	.....	92 June	9	.....	.....	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marysville.....	Lewis and Clarke.....	5,376	9	40.9	90 Aug.	11	-33	Jan.	24	9	17.37	4.45 May	0.18 Oct.	.....	51.8	62	220	101	34	SW
Miles City.....	Custer.....	2,374	12	45.4	98 July	11	-22	Jan.	26	11	10.52	2.86 May	0.05 Jan.	.....	.....	73	176	127	62	S
Missoula.....	Missoula.....	3,225	23	45.1	97 July	23	-16	Jan.	15	23	.....	4.53 May	.....	.....	.....	.....	.....	.....	.....	.....
Oxando.....	Powell.....	4,136	4	.....	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Parrot.....	Madison.....	4,425	4	.....	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Plains.....	Missoula.....	2,473	4	44.0	92 July	20	-15	Jan.	25	4	17.84	4.74 July	0.10 Mar.	.....	38.0	57	166	45	154	SW
Poplar.....	Valley.....	2,200	17	40.8	99 Aug.	14	-29	Dec.	12	20	.....	.....	.....	.....	32.6	.....	236	66	63	W
Ridgeland.....	Dawson.....	.....	3	.....	96 July	15	-31	Feb.	8	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Paul's.....	Choteau.....	4,150	7	42.1	91 July	31	-31	Jan.	29	7	17.25	5.63 May	0.14 Mar.	.....	33.4	75	180	10	85	S E
St. Peter's.....	Cascade.....	.....	2	40.6	88 Aug.	25	-31	Jan.	25	2	17.26	6.61 May	0.26 Apr.	.....	42.5	77	159	78	128	SW
Springhook.....	Dawson.....	.....	2	.....	101 Aug.	24	-25	Dec.	6	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Teston.....	Broadwater.....	.....	2	42.3	92 June	9	-25	Jan.	26	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Townsend.....	Broadwater.....	4,000	2	42.1	94 July	31	-32	Jan.	25	2	10.14	3.51 May	0.20 Jan.	.....	.....	82	152	128	85	.....
Troy.....	Flathead.....	2,250	7	44.0	92 July	30	-14	Jan.	27	8	32.13	5.91 Nov.	0.61 Aug.	.....	61.0	128	88	106	171	SW
Twin Bridges.....	Madison.....	.....	3	41.0	90 July	31	-26	Jan.	25	.....	.....	3.70 May	0.10 Sept.	.....	17.2	.....	187	10	128	S
Two But.....	Meagher.....	4,800	12	39.9	91 Aug.	24	-38	Jan.	25	12	13.75	2.85 May	T Aug.	.....	70.5	33	88	182	94	SW
Utica.....	Fergus.....	4,200	4	.....	.....	.....	.....	.....	24	9	11.94	3.28 June	0.14 Jan.	.....	.....	.....	.....	.....	.....	.....
Wibaux.....	Dawson.....	2,350	10	.....	.....	.....	.....	.....	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yale.....	Fergus.....	.....	7	40.7	91 Aug.	23	-24	Jan.	29	8	13.56	2.98 June	T Sept.	.....	49.5	66	199	58	108	W

T. Trace.

COST OF LIVING.

STATEMENT OF RETAIL PRICES OF CERTAIN COMMODITIES WHICH ENTER INTO THE COST OF LIVING, AS
 AVERAGED FROM THE REPORTS OF LEADING MERCHANTS, DEALERS AND BUTCHERS, IN THE
 COUNTY SEATS OF THE RESPECTIVE COUNTIES DURING THE YEAR ENDED JUNE 30, 1902.

COUNTY	County Seat	First Quality of Imported Flour, Per 100 Lbs.....	First Quality of Montana Flour, Per 100 Lbs.....	Second Quality of Imported Flour, Per 100 Lbs.....	Second Quality of Montana Flour, Per 100 Lbs.....	Corn Meal, Per Pound.....	Rolled Oats, Per Pound.....	Sugar, Per Pound.	Good Grade Un-colored Japan Tea, Per Pound..	Gunpowder Tea, Per Pound.....	Fair Grade of Cheap Coffee, Per Pound.....	Good Mocha and Java Coffee, Per Pound.....	Lard, Per Pound..	Bacon, Per Pound	Ham, Per Pound .	Butter, Per Pound	Eggs, Per Dozen.	Potatoes, Per 100 Lbs.....	Good Med'm Grade Canned Vegetables, Per Can ...	Good Med'm Grade Canned Fruits, Per Can.....	Boiling Meats, Per Pound.....	Sirloin Steak, Per Pound.....
Beaverhead	Dillon	3.00	2.50	.....	2.00	.04	.06	.06¾	.60	.75	.15	.35	.15	.16	.16	.25	.25	1.25	.15	.20	.10	.18
Broadwater	Townsend ..	3.00	2.50	.....	2.00	.04	.06	.06¾	.60	.75	.15	.35	.15	.16	.16	.25	.25	1.25	.15	.20	.10	.18
Carbon	Red Lodge ..	3.00	2.75	.....	2.25	.026	.04	.065	.60	.75	.14	.40	.12¾	.13	.13	.25	.20	1.00	.12½	.16¾	.12½	.18
Cascade	Great Falls ..	2.60	2.60	.....	2.50	.03	.05	.065	.60	.75	.12½	.40	.15	.15	.15	.30	.25	1.50	.16¾	.20	.12½	.18
Choteau	Ft. Benton ..	3.25	2.45	.....	2.20	.03	.05	.07	.60	.50	.12½	.40	.15	.17	.17	.30	.25	1.25	.15	.25	.12½	.18
Custer	Miles City ..	3.00	2.50	.....	2.00	.04	.06	.06¾	.60	.75	.15	.35	.15	.16	.16	.25	.25	1.25	.15	.20	.08	.18
Dawson	Glendive	2.30	2.30	.....	.....	.03	.05	.08	.65	.65	.12½	.35	.15	.15	.15	.30	.25	1.75	.12½	.20	.08	.18
Deer Lodge.....	Anaconda ..	2.75	2.50	.....	1.75	.025	.03	.05½	.50	.65	.12½	.35	.12½	.12½	.12½	.25	.25	1.25	.15	.18	.10	.18
Fergus	Lewistown ..	3.25	3.00	.....	2.50	.03	.04	.065	.50	.60	.13½	.40	.14	.16	.16	.30	.30	1.50	.15	.25	.12½	.18
Flathead	Kalispell	3.25	2.50	.....	2.00	.035	.04	.07	.60	.75	.15	.35	.15	.17½	.16	.25	.25	1.00	.12½	.20	.10	.15
Gallatin	Bozeman .....	.....	2.50	.....	2.00	.028	.036	.055	.50	.75	.12½	.40	.15	.15	.15	.30	.15	1.00	.10	.20	.10	.15
Granite	Philipsburg ..	3.00	2.75	2.50	2.00	.03	.04	.07	.50	.75	.13	.35	.12	.15	.15	.25	.25	1.50	.15	.20	.10	.16
Jefferson	Boulder	2.75	2.50	2.25	2.00	.03	.05	.05¾	.32	.34	.11	.30	.12½	.19	.17	.25	.30	1.00	.15	.20	.10	.18
Lewis and Clarke	Helena	2.60	2.30	.....	1.90	.03	.04	.06¾	.60	.75	.15	.40	.15	.18	.17	.30	.25	1.00	.17½	.20	.08	.18
Madison	Virginia City ..	.....	2.60	.....	2.00	.025	.035	.05¾	.45	.75	.12½	.40	.15	.17	.16	.30	.25	1.00	.15	.20	.12½	.16
Meagher.....	W. S. Sprgs ..	3.00	2.75	.....	2.25	.03	.04	.03	.50	.65	.12½	.32½	.15	.16	.16	.30	.25	1.50	.13½	.20	.12½	.18
Missoula	Missoula	3.25	2.15	2.75	2.25	.025	.04	.06	.60	.50	.12½	.40	.15	.18	.17	.25	.30	.75	.12½	.20	.10	.18
Park	Livingston ..	2.50	.....	2.25	.....	.027	.037	.06½	.40	.40	.12½	.40	.12½	.15	.15	.25	.25	1.00	.12½	.25	.10	.20
Powell.....	Deer Lodge ..	2.75	2.50	.....	2.00	.027	.037	.064	.50	.50	.12½	.40	.14	.15	.14	.25	.25	1.50	.12½	.20	.12	.18
Ravalli.....	Hamilton	3.00	2.60	.....	2.00	.024	.04	.058	.50	.75	.12½	.45	.15	.18	.16	.20	.20	1.50	.13½	.17½	.10	.18
Rosebud	Forsyth	2.25	2.25	.....	.....	.03	.04	.06¾	.50	.65	.15	.40	.13	.15	.15	.30	.25	1.50	.15	.25	.10	.20
Silver Bow	Butte	2.60	2.30	2.00	1.90	.03	.04	.06¾	.60	.75	.15	.40	.15	.18	.17	.30	.25	1.00	.17½	.20	.10	.18
Sweet Grass	Big Timber ..	2.50	2.35	.....	2.30	.025	.035	.06½	.50	.70	.15	.35	.15	.15	.15	.30	.30	1.25	.15	.20	.10	.18
Teton	Choteau .....	.....	2.50	.....	.....	.03	.04	.08½	.60	.75	.16¾	.35	.15	.16	.16	.35	.20	1.00	.20	.25	.10	.15
Valley	Glasgow .....	.....	2.50	.....	.....	.03	.028	.065	.50	.75	.15	.40	.15	.18	.17	.30	.25	3.00	.12½	.20	.12½	.18
Yellowstone	Billings	3.00	2.50	2.50	1.75	.03	.05	.07	.50	.70	.15	.45	.14	.15	.15	.25	.25	1.75	.12½	.20	.10	.18

MARKET PRICES OF FARM PRODUCTS.

AVERAGE PRICES AT WHICH MONTANA FARMERS COULD MARKET THE PRODUCTS NAMED, (TAKING THEIR PAY IN TRADE, AT THE RESPECTIVE COUNTY SEATS DURING THE YEAR ENDING JUNE 30, 1902.

COUNTY	County Seat	Wheat— Per 100 Lbs..	Rye — Per 100 Lbs..	Barley— Per 100 Lbs..	Oats— Per 100 Lbs..	Potatoes— Per 100 Lbs..	Peas— Per 100 Lbs..	Rutabagas— Per 100 Lbs..	Onions— Per 100 Lbs..	Baled Hay— First Quality, Per Ton.....	Baled Hay— Second Qual- ity, Per Ton..	Loose Hay— First Quality, Per Ton.....	Loose Hay— Second Qual- ity, Per Ton..	Eggs— Per Dozen..	Ranch Butter —Per Lb.,	Poultry— Per Dozen...
Beaverhead	Dillon	1.05	..	..	1.15	1.00	..	.60	1.50	12.00	10.00	10.00	8.00	.20	.20	5.00
Broadwater	Townsend	1.00	..	..	1.25	1.10	..	.85	1.75	12.00	10.00	10.00	8.00	.25	.25	5.00
Carbon	Red Lodge	1.05	..	..	1.05	1.00	..	.50	1.50	11.00	9.00	9.00	7.00	.20	.20	4.50
Cascade	Great Falls	1.00	1.00	1.00	.90	.90	5.00	1.00	1.50	14.00	10.00	12.00	8.00	.25	.25	5.00
Chouteau	Fort Benton	1.10	..	..	1.00	1.00	..	.75	1.25	12.00	10.00	10.00	8.00	.25	.25	5.00
Custer	Miles City	1.15	..	..	1.00	1.25	..	.75	1.75	10.00	..	9.50	8.50	.25	.25	4.00
Glendive	Glendive	1.60	..	..	1.50	2.00	..	1.50	4.00	15.00	13.00	10.00	8.00	.25	.25	4.50
Anaconda	Anaconda	1.50	..	..	1.40	1.25	..	1.50	2.50	12.00	10.00	10.00	8.00	.25	.25	4.50
Bozeman	Lewistown	1.00	..	..	1.00	1.50	..	..	2.30	12.00	10.00	12.00	10.00	.30	.25	4.50
Flathead	Kalispell	.99	.75	1.00	1.00	.85	..	.50	1.50	9.00	8.00	9.00	8.00	.25	.25	4.50
Gallatin	Bozeman	1.10	..	1.77	1.00	.80	..	.75	1.00	12.00	10.00	9.00	7.00	.15	.25	4.50
Granite	Phillipsburg	1.00	..	..	1.10	1.15	..	.75	2.00	10.50	8.50	10.00	8.00	.27	.23	4.50
Jefferson	Boulder	1.18	1.30	1.25	1.35	1.25	..	..	1.75	13.20	12.25	10.00	7.00	.30	.20	..
Lewis and Clarke	Helena	1.10	1.25	1.00	1.25	1.20	..	.75	1.25	13.00	11.50	13.00	10.00	.20	.25	5.00
Madison	Virginia City	1.15	1.10	..	1.15	.75	2.00	1.00	2.00	12.00	10.00	10.00	8.00	.25	.25	4.50
Meagher	White Sulphur Springs	1.25	1.25	..	1.15	..	..	..	..	12.00	10.00	10.00	8.00	.25	.25	5.50
Missoula	Missoula	1.00	..	..	1.00	.75	..	.50	1.00	11.50	..	11.00	..	.40	.25	4.50
Park	Livingston	1.25	..	..	1.50	.90	..	1.00	2.50	13.50	10.50	12.50	10.50	.25	.25	5.00
Powell	Deer Lodge	1.00	..	..	1.05	1.20	2.50	.50	1.00	10.00	9.50	8.00	7.50	.20	.20	5.00
Ravalli	Hamilton	1.50	..	..	1.50	1.50	..	..	3.50	14.00	12.00	12.00	10.00	.25	.25	3.00
Rosebud	Forsyth	1.00	..	..	1.10	1.00	..	.50	1.50	12.00	9.00	..	..	.35	.25	4.50
Silver Bow	Butte	1.00	..	..	1.00	1.00	..	1.50	1.50	12.50	10.00	9.00	8.00	.30	.30	4.50
Sweet Grass	Big Timber	1.25	1.00	1.00	1.00	1.00	..	1.00	2.25	10.00	8.00	7.00	6.00	.25	.25	4.50
Teton	Choteau	1.15	..	..	1.75	2.50	..	1.00	4.00	..	20.00	..	..	.25	..	..
Valley	Glasgow	1.15	..	..	1.00	..	..	..	1.50	12.00	10.00	10.00	8.00	.20	..	..
Yellowstone	Billings	1.15	..	..	1.00	.90	..	.50	1.50	12.00	10.00	10.00	8.00	.20	.20	4.50

PERCENTAGE OF IMPORTED PRODUCTS SHIPPED INTO MONTANA.

STATEMENT SHOWING PROPORTIONATE SALES, EXPRESSED IN PERCENTAGES, OF CERTAIN "MONTANA" PRODUCTS AS COMPARED WITH THE SALES OF LIKE PRODUCTS SHIPPED INTO MONTANA FROM OTHER STATES, (DESIGNATED "IMPORTED") AS AVERAGED FROM THE REPORTS OF PRINCIPAL DEALERS AT THE RESPECTIVE COUNTY SEATS, DURING THE YEAR ENDED JUNE 30, 1902.

COUNTY	County Seat	Flour—Per Cent. Sold of		Pork, Bacon and Ham—Per Cent. Sold of		Lard—Per Cent. Sold of		Butter—Per Cent. Sold of		Cheese—Per Cent. Sold of		Poultry—Per Cent. Sold of		Eggs—Per Cent. Sold of	
		Mont.	Imp.	Mont.	Imp.	Mont.	Imp.	Mont.	Imp.	Mont.	Imp.	Mont.	Imp.	Mont.	Imp.
Beaverhead	Dillon	5	95	100	100	.....	100	10	90	.....	100	100	.....	100	.....
Broadwater	Townsend	100	.....	100	100	20	80	40	10	.....	100	75	25	90	10
Carbon	Red Lodge	75	25	100	100	10	90	50	50	.....	100	50	50	25	75
Cascade	Great Falls	90	10	100	100	15	85	20	80	.....	100	100	100	10	90
Choteau	Fort Benton	95	5	100	100	2	98	95	5	.....	100	75	25	90	10
Custer	Miles City	80	20	100	100	.....	100	75	25	.....	100	75	25	75	25
Dawson	Glendive	25	75	100	100	.....	100	10	90	.....	100	100	100	75	25
Deer Lodge	Anaconda	50	50	90	10	10	90	10	90	.....	100	.....	.....	5	95
Fergus	Lewistown	80	20	100	100	.....	100	30	70	.....	100	.....	.....	50	50
Flathead	Kalispell	99	1	100	100	5	95	50	50	.....	100	.....	.....	50	50
Gallatin	Bozeman	100	.....	95	5	5	95	90	10	.....	100	100	.....	100	.....
Granite	Phillipsburg	35	65	100	100	.....	100	5	95	.....	100	2	98	10	90
Jefferson	Boulder	65	35	100	100	.....	100	50	50	.....	100	100	100	80	20
Lewis and Clarke	Helena	75	25	100	100	25	75	25	75	.....	100	70	95	20	70
Madison	Virginia City	100	.....	95	5	5	95	50	50	.....	100	95	5	75	25
Meagher	White Sulphur Springs	85	15	100	100	.....	100	25	75	.....	100	.....	.....	70	30
Missoula	Missoula	75	25	100	100	.....	100	80	20	.....	100	.....	.....	10	90
Park	Livingston .....	.....	100	100	100	.....	100	25	75	.....	100	25	75	80	20
Powell	Deer Lodge	80	20	100	100	.....	100	50	50	.....	100	90	10	25	75
Ravalli	Hamilton	70	30	100	100	.....	100	100	.....	.....	100	75	.....	80	20
Rosebud	Forsyth .....	.....	100	100	100	.....	100	2	98	.....	100	100	.....	20	80
Silver Bow	Butte	55	45	95	5	5	95	20	80	.....	100	75	5	5	95
Sweet Grass	Big Timber	65	35	85	15	15	85	60	40	.....	100	85	15	50	50
Teton	Choteau	100	.....	100	100	.....	100	20	80	.....	100	95	10	90	10
Valley	Glasgow	100	.....	100	100	.....	100	75	25	.....	100	100	75	90	10
Yellowstone	Billings	50	50	100	100	.....	100	25	75	.....	100	50	50	25	75

TABLE SHOWING ASSESSED VALUATION OF THE SEVERAL CLASSES OF REAL PROPERTY AFTER EQUALIZATION BY THE COUNTY BOARDS OF EQUALIZATION FOR THE YEAR 1901.

ASSESSED VALUATIONS.

(Taken from the Report of the State Board of Equalization.)

COUNTIES	Acres of Land	Value of Real Estate	Value of Improvements on Same	Improvements Listed to Another	Town or City Lots	Improvements on Same	Mining Claims	Improvements on Same	Telegraphs	Telephones	Mining Ditches	Irrigating Ditches	Coal Lands	Depots	Total Real Estate
Beaverhead	245,125	742,154	391,280	3,510	183,770	372,600	17,793	60,900	6,240	6,828	19,455	.....	.....	27,025	1,812,110
Broadwater	205,674	587,493	167,908	28,560	76,487	108,596	.....	.....	7,266	5,050	.....	.....	.....	11,675	1,012,490
Carbon	45,229	436,588	87,712	224,670	102,844	179,795	.....	.....	1,960	1,560	.....	29,565	.....	113,343	1,177,937
Cascade	355,611	3,678,341	1,609,453	128,315	3,048,703	1,841,413	23,225	14,500	6,260	12,082	.....	.....	.....	83,620	9,845,912
Choteau	209,838	534,949	369,735	.....	158,929	320,000	.....	.....	18,860	1,809	.....	1,455	.....	50,400	1,456,128
Custer	661,230	515,394	122,405	60,810	170,644	345,640	.....	.....	8,140	500	.....	1,210	.....	8,900	1,233,643
Pawson	624,040	237,642	11,675	47,384	72,632	175,165	.....	.....	5,040	.....	.....	.....	.....	24,375	573,813
Poor Lodge	87,532	283,250	1,248,015	8,300	1,232,243	1,323,061	12,099	9,150	4,082	5,469	4,150	.....	.....	23,290	4,173,019
Fergus	.....	1,222,080	557,166	.....	136,570	319,225	.....	.....	.....	7,825	3,300	.....	.....	.....	2,246,166
Flathead	473,617	1,595,972	180,530	43,730	511,576	342,140	4,570	6,000	14,050	1,995	.....	6,070	15,330	46,690	2,768,363
Gallatin	472,972	2,489,705	472,280	13,515	597,495	962,900	.....	.....	4,330	4,005	.....	25,600	.....	20,875	4,590,765
Granite	104,164	258,409	192,870	135,280	171,326	207,545	46,404	125,000	9,243	4,127	2,500	10,000	.....	.....	1,162,704
Jefferson	214,297	519,467	230,187	.....	246,685	294,670	75,734	385,368	7,575	7,307	60,025	.....	.....	48,655	1,375,681
Lewis & Clarke	416,321	1,407,960	929,235	.....	3,741,013	4,060,950	64,586	249,446	4,140	22,530	2,880	.....	.....	36,350	10,519,090
Madison	367,644	754,705	626,930	7,545	113,320	309,005	35,025	120,300	3,640	6,285	3,000	.....	.....	7,060	1,987,115
Meagher	591,508	1,694,959	172,925	28,245	105,985	156,300	6,985	4,000	2,100	3,675	300	.....	.....	2,650	1,578,124
Missoula	460,693	1,839,184	276,823	26,855	935,531	1,012,570	.....	.....	31,914	15,552	.....	39,748	.....	38,350	4,236,327
Park	391,765	892,420	257,685	52,972	508,581	472,945	10,172	.....	3,890	4,087	.....	7,040	.....	.....	2,299,792
Powell	391,167	735,050	192,141	26,262	71,920	214,435	12,752	7,000	5,660	5,637	18,432	.....	.....	10,835	1,300,114
Ravalli	247,684	1,086,657	316,965	.....	191,545	207,530	.....	.....	1,320	2,104	.....	.....	.....	6,400	1,812,521
Rosebud	282,690	377,553	83,999	25,685	50,910	75,537	.....	.....	3,471	.....	.....	.....	.....	20,425	642,580
Silver Bow	58,757	311,435	251,405	450,420	8,298,535	6,361,310	97,980	936,350	9,250	39,175	11,175	.....	.....	63,190	16,830,225
Sweet Grass	502,755	664,741	106,260	33,675	71,764	134,870	.....	.....	7,800	1,183	.....	.....	.....	10,050	1,029,343
Teton	197,987	520,383	104,157	29,095	69,287	77,025	.....	.....	9,360	2,558	.....	3,000	.....	41,435	856,300
Valley	6,629	19,166	7,619	67,331	18,807	77,045	.....	.....	15,370	.....	.....	90	.....	33,470	238,898
Yellowstone	835,288	959,713	183,266	46,555	592,093	777,040	.....	.....	31,149	4,825	.....	43,678	.....	41,970	2,593,309
Totals	8,651,348	23,185,370	9,149,646	1,489,014	21,409,195	20,729,320	407,325	1,918,014	227,010	106,159	125,217	167,456	15,330	773,753	79,762,809

ASSESSED VALUATIONS.

TABLE SHOWING THE ASSESSED VALUATION OF THE SEVERAL CLASSES OF REAL PROPERTY AFTER EQUALIZATION
BY THE COUNTY BOARDS OF EQUALIZATION FOR THE YEAR 1902.

(Taken from the Report of the State Board of Equalization.)

COUNTIES	Acres of Land	Value	Improvements	Improvements Listed to Another	City or Town Lots	Improvements	Mining Claims	Improvements	Telegraphs	Telephones	Coal Lands	Mining Ditches	Irrigating Ditches	Depots	Total Value Real Estate
Beaverhead	284,795	811,515	371,486	4,150	189,967	417,395	18,893	45,300	9,027	10,290	.....	.....	.....	26,330	1,904,493
Broadwater	207,314	626,540	167,838	26,505	78,188	115,325	.....	.....	7,266	5,590	.....	.....	18,600	10,165	1,056,017
Carbon	65,523	547,320	143,463	165,660	102,098	208,787	.....	.....	3,372	5,995	.....	.....	24,745	8,684	1,210,124
Cascade	650,279	3,290,226	1,740,632	99,453	3,052,772	2,012,902	23,346	43,600	8,239	17,120	.....	1,500	.....	90,320	10,380,110
Choteau	257,247	681,504	411,815	.....	163,679	362,460	.....	.....	25,600	1,700	.....	.....	2,000	77,270	1,726,028
Custer	684,242	524,824	127,480	69,404	165,025	351,375	.....	.....	11,600	2,135	.....	.....	1,350	9,800	1,262,993
Dawson	645,062	282,989	12,755	53,030	72,264	187,595	.....	.....	10,425	.....	.....	.....	.....	28,400	647,458
Deer Lodge	83,432	280,007	2,372,603	9,200	1,244,009	1,358,895	12,584	9,150	6,006	5,933	.....	17,110	.....	23,200	5,439,97
Fergus	744,133	1,318,729	589,657	.....	201,762	382,370	.....	.....	.....	7,625	.....	3,300	.....	.....	2,503,443
Flathead	679,483	1,857,445	210,575	55,840	543,274	437,855	4,570	6,000	19,050	735	15,330	.....	2,150	54,105	3,207,229
Gallatin	489,320	2,753,540	445,070	6,835	583,715	1,044,870	.....	.....	12,585	6,535	.....	.....	16,600	23,025	4,892,775
Granite	113,823	267,043	114,599	94,755	144,595	232,984	36,354	.....	8,133	4,934	.....	.....	10,925	.....	1,081,749
Jefferson	211,936	455,935	298,905	.....	197,108	263,365	51,371	311,090	10,167	13,000	.....	.....	49,750	37,765	1,488,455
Lewis & Clarke	447,497	1,555,270	1,706,345	.....	3,474,855	3,757,695	66,160	237,965	16,410	19,780	.....	2,580	.....	33,725	10,870,785
Madison	382,792	890,525	586,150	14,010	178,350	336,075	38,195	115,200	6,000	21,132	.....	.....	.....	11,365	2,197,005
Meagher	623,083	1,049,204	176,015	35,065	92,288	155,315	8,540	4,500	.....	5,955	.....	300	.....	2,750	1,529,932
Missoula	816,793	2,088,766	335,759	30,509	968,100	1,109,954	.....	.....	36,985	14,122	.....	.....	38,268	59,100	4,681,554
Park	386,359	951,103	287,225	57,800	516,139	541,325	10,755	.....	8,519	6,138	.....	.....	11,005	.....	2,390,000
Powell	403,123	698,838	172,025	38,695	72,554	212,410	31,023	28,873	15,687	6,760	.....	.....	.....	11,650	1,302,272
Ravalli	266,353	1,149,890	323,015	14,510	196,116	221,675	2,669	4,900	1,475	4,474	.....	3,625	54,500	5,050	1,981,899
Rosebud	413,914	366,719	75,445	28,950	53,616	91,505	.....	.....	14,195	.....	.....	.....	.....	23,425	653,855
Silver Bow	86,996	329,890	273,870	453,970	8,986,005	7,359,990	102,940	952,350	9,425	36,905	.....	.....	.....	65,570	18,555,605
Sweet Grass	528,047	706,109	112,155	38,045	66,542	133,880	.....	.....	9,117	4,130	.....	14,650	.....	.....	1,080,878
Teton	224,529	752,308	108,187	33,550	69,265	81,215	.....	.....	14,535	3,910	.....	.....	3,000	35,235	1,101,275
Valley	10,414	31,243	13,740	75,914	31,045	83,940	.....	.....	20,945	.....	.....	.....	.....	34,715	291,562
Yellowstone	886,047	1,033,490	204,454	49,505	502,578	882,065	.....	.....	24,974	9,512	.....	.....	43,795	53,480	2,894,853
Totals	10,542,536	25,300,972	11,381,563	1,455,346	21,945,909	22,344,222	407,440	1,908,928	310,353	214,413	15,330	174,381	76,688	736,029	86,471,577

ASSESSED VALUATIONS.

TABLE SHOWING THE ASSESSED VALUATION OF CERTAIN CLASSES OF PERSONAL PROPERTY IN EACH COUNTY AFTER EQUALIZATION BY COUNTY BOARDS OF EQUALIZATION FOR THE YEAR 1901.

(Taken from the Report of the State Board of Equalization.)

COUNTIES	Mortgages, Bonds, Etc...	Express, St. R. R., Gas and Elec. Light Companies...	Jewelry	Furniture.....	Musical In- struments.....	Libraries.....	Stocks of Goods	Fixtures Sa- loons, Etc...	Farming Utensils	Machinery...
Beaverhead	74,555	.....	2,035	20,215	7,300	3,070	176,522	11,655	3,590	20,130
Broadwater	42,962	.....	1,180	18,655	4,459	630	60,319	5,945	5,032	63,072
Carbon	94,090	195,067	1,042	22,185	5,738	2,265	166,926	8,905	9,173	87,905
Cascade	129,880	99,677	5,419	165,238	32,555	6,845	571,279	46,446	24,870	450,901
Choteau	62,810	.....	1,677	43,290	5,840	895	205,735	14,020	14,838	18,350
Custer	44,831	.....	3,130	51,704	9,610	6,180	137,814	16,131	.....	14,191
Lawson	57,065	.....	2,891	30,082	9,658	970	70,642	7,082	2,300	12,168
Leier Lodge	136,437	184,215	1,020	20,100	4,109	2,825	344,493	30,885	3,295	63,375
Plagus	159,683	.....	1,610	38,115	7,155	2,565	232,101	18,579	22,710	127,785
Flathead	55,106	31,090	1,315	40,780	9,460	2,220	189,340	9,680	22,207	117,955
Gallatin	196,295	6,000	4,420	63,295	16,980	9,900	222,270	13,385	54,690	49,680
Granite	76,031	72,450	3,580	22,440	7,515	2,190	107,035	14,230	7,095	32,835
Jefferson	74,299	.....	5,265	54,355	13,650	2,040	94,634	14,790	5,014	139,173
Lewis and Clarke	298,755	522,185	22,275	256,450	40,400	23,140	970,379	82,304	4,330	344,030
Madison	259,625	4,500	4,840	14,690	13,830	1,230	182,635	8,835	12,230	22,115
Meagher	58,818	2,000	2,210	22,190	6,535	1,295	116,050	9,135	2,015	13,265
Missoula	163,999	31,000	4,552	78,503	12,525	6,100	366,390	35,320	7,673	129,888
Park .....	.....	45,732	2,655	53,500	11,130	4,275	226,488	20,939	16,970	83,495
Powell	57,568	10,763	1,468	3,800	3,455	1,450	94,303	5,485	5,742	25,152
Ravalli	106,585	16,000	465	20,549	7,730	745	161,284	8,280	6,538	19,334
Rosebud	19,899	464,050	1,335	16,528	4,004	160	64,117	6,039	9,474	.....
Silver Bow	344,560	4,500	15,025	192,910	36,075	39,150	1,717,220	195,305	1,850	646,450
Sweet Grass	20,198	.....	810	16,327	6,335	2,045	87,721	6,875	8,080	12,490
Teton	71,407	.....	320	13,199	1,820	790	88,420	3,765	1,402	10,409
Valley	42,819	.....	2,832	20,829	4,721	1,390	72,993	9,954	1,483	7,580
Yellowstone .....	.....	55,000	4,135	83,480	16,120	5,295	402,190	34,958	13,919	54,263
Totals	2,558,509	1,744,219	97,506	1,383,409	298,610	129,660	7,129,300	638,927	267,050	2,565,117

ASSESSED VALUATIONS.
 TABLE SHOWING THE ASSESSED VALUATION OF CERTAIN CLASSES OF PERSONAL PROPERTY IN EACH
 COUNTY AFTER EQUALIZATION BY COUNTY BOARDS OF EQUALIZATION FOR THE YEAR 1901—Continued.
 (Taken from the Report of the State Board of Equalization.)

Tracing No...	Wagons and Harness	Hay, Grain and Wool....	Lumber and Wood	Net Proceeds of Mines.....	Tailings and Ore	Solvent Cred- its and Bank Deposits.....	Money on Hand or Spe- cial Deposit..	Bank Stock...	Notes and Bonds	Insurance Premiums ...	Steamboats ...	Other Personal Property	Total	Cattle.....	Total Personal Prop'ty Except Sheep, Horses, Hogs, Goats & Buffaloes
1	37,924	3,971	1,150	91,676	.....	44,980	15,206	45,382	.....	.....	.....	27,219	1,031,050	756,616	1,787,666
2	23,960	5,371	3,620	6,469	.....	13,688	13,985	25,000	.....	.....	.....	5,083	513,078	218,654	731,732
3	49,153	1,297	23,800	30,461	.....	50,694	5,840	.....	.....	.....	.....	30,111	1,254,176	448,138	1,702,314
4	76,438	150	21,440	30,897	.....	79,804	11,823	179,806	.....	.....	.....	70,863	2,614,018	825,726	3,439,744
5	69,265	3,680	.....	.....	.....	38,840	45,138	119,880	.....	.....	.....	4,694	2,485,108	1,375,314	3,860,422
6	48,565	.....	1,060	.....	.....	24,202	13,167	209,155	.....	.....	.....	10,042	1,520,055	1,385,832	2,905,887
7	23,739	.....	.....	.....	.....	17,339	.....	.....	.....	.....	.....	1,279	1,028,427	969,145	1,997,572
8	21,725	750	20,800	.....	.....	10,950	31,935	.....	.....	.....	.....	651,190	1,586,951	56,155	1,643,106
9	73,455	1,135	600	32,200	.....	37,858	1,930	186,703	.....	.....	.....	7,633	2,833,550	888,306	3,721,856
10	48,800	18,640	105,135	.....	.....	585	2,309	46,318	.....	7,485	10,450	5,260	838,331	256,562	1,094,893
11	92,540	17,130	3,875	.....	.....	33,300	30,435	.....	.....	.....	.....	117,490	1,226,315	464,745	1,691,060
12	23,688	6,130	37,095	258	.....	5,640	28,384	.....	.....	.....	.....	16,180	546,330	188,560	734,890
13	42,894	.....	17,782	10,500	.....	36,055	54,581	27,000	12,000	.....	.....	22,810	727,158	275,350	1,002,508
14	72,398	.....	.....	261,805	211,610	98,476	133,662	645,534	20,000	104,953	.....	300,545	4,663,354	510,730	5,174,804
15	73,720	2,945	9,245	1,000	.....	511,895	.....	72,400	.....	.....	.....	4,070	1,610,625	668,070	2,278,695
16	30,880	7,490	835	.....	.....	56,700	22,350	98,135	.....	.....	.....	7,205	1,362,393	489,931	1,852,324
17	48,584	9,988	493,595	.....	.....	6,361	4,991	.....	.....	.....	.....	230,741	1,772,027	373,939	2,145,966
18	40,885	1,135	.....	52,000	.....	.....	19,179	94,907	1,700	.....	.....	95,053	1,121,766	327,630	1,449,396
19	36,433	23,630	58,215	4,000	.....	18,945	32,500	51,000	.....	.....	.....	26,999	768,804	387,341	1,156,145
20	39,947	.....	174,095	.....	.....	33,210	13,403	50,336	8,343	.....	.....	2,967	921,141	292,985	1,214,126
21	17,257	.....	.....	.....	.....	4,601	21,000	.....	.....	.....	.....	25,786	780,145	790,235	1,570,380
22	69,190	9,705	3,440	15,760,005	.....	486,330	864,440	411,740	.....	.....	.....	273,495	21,632,905	122,460	21,755,365
23	19,042	5,991	3,250	.....	.....	49,857	5,600	.....	.....	.....	.....	2,753	1,017,533	409,921	1,427,454
24	25,760	50	410	.....	.....	15,200	460	.....	.....	.....	.....	3,536	1,058,326	447,562	1,505,888
25	21,146	2,840	1,420	.....	.....	36,816	250	.....	480	.....	.....	11	782,163	500,733	1,282,896
26	49,715	787	325	.....	.....	6,750	34,673	72,330	.....	.....	.....	101,606	1,987,891	585,303	2,573,194
	1,177,098	122,815	981,237	16,281,271	211,610	1,719,076	1,407,241	2,336,216	42,523	112,438	10,450	2,044,571	57,683,895	14,015,993	71,699,888

ASSESSED VALUATIONS.

TABLE SHOWING THE ASSESSED VALUATION OF CERTAIN CLASSES OF PERSONAL, PROPERTY IN EACH COUNTY AFTER EQUALIZATION BY COUNTY BOARDS OF EQUALIZATION FOR THE YEAR 1902.

(Taken from the Report of the State Board of Equalization.)

COUNTIES	Mortgages.	Companies	Franchises	Jewelry	Furniture	Musical In- struments....	Libraries.	Goods and Wares.....	Fixtures, Sa- loons, Etc....	Farming Utenstils.....	Machinery....	Wagons	Grain	Lumber and Wood.....	Coal	Coke.....
Beaverhead	98,837	.....	.....	2,047	24,358	7,580	2,510	161,325	17,630	5,501	15,987	41,317	3,675	1,350	.....	.....
Broadwater	33,595	2,100	.....	900	21,445	5,360	410	58,885	5,665	5,155	26,333	24,045	8,065	1,100	.....	.....
Carbon	81,450	2,500	7,500	605	19,085	4,550	2,845	149,060	11,110	3,265	93,970	52,120	200	4,970	.....	.....
Cascade	237,908	96,300	15,000	5,191	168,661	32,268	7,075	642,692	46,640	27,623	454,308	74,295	.....	17,303	.....	.....
Chouteau	66,445	4,000	.....	1,500	48,250	5,590	1,060	214,800	16,510	8,085	28,201	77,060	580	.....	.....	.....
Custer	34,719	.....	.....	3,270	53,156	8,173	6,320	115,416	20,215	52,345	.....	84,763	.....	6,583	40	.....
Dawson	39,080	.....	.....	1,708	30,445	10,010	950	71,163	6,813	1,663	12,160	29,782	.....	.....	.....	.....
Deer Lodge	103,253	161,415	.....	1,085	12,950	2,025	3,600	357,325	32,535	2,730	517,995	18,940	750	15,890	.....	.....
Fergus	131,180	.....	.....	1,765	42,330	8,565	2,730	261,118	21,935	32,510	118,060	82,250	1,905	125	.....	.....
Flathead	78,438	69,280	.....	1,270	45,530	10,355	2,280	272,825	16,125	25,050	112,225	52,785	17,360	116,105	.....	.....
Gallatin	174,885	12,500	.....	4,255	63,840	18,685	10,885	230,820	14,880	54,910	54,820	84,590	30,270	3,165	.....	.....
Granite	43,573	25,225	.....	3,545	19,453	6,706	2,385	104,190	11,500	7,287	179,262	24,497	2,782	21,125	.....	.....
Jefferson	50,670	132,460	.....	5,520	62,561	13,628	2,420	101,615	10,565	9,321	80,617	41,838	690	5,185	.....	.....
Lewis and Clarke	184,065	333,870	264,595	22,280	267,820	43,140	26,635	933,510	78,025	14,885	147,255	76,515	725	11,580	.....	.....
Madison	189,960	5,425	.....	4,380	20,415	13,455	1,620	191,235	15,505	10,740	25,655	75,425	3,980	13,350	.....	.....
Meagher	59,019	1,500	.....	2,750	24,560	8,115	1,730	122,165	8,940	3,865	21,390	33,730	250	2,940	.....	.....
Missoula	172,694	3,200	30,000	5,151	74,131	10,793	5,780	386,134	36,480	7,956	103,831	51,241	16,279	522,155	.....	.....
Park	46,502	41,332	6,000	2,435	62,235	12,695	3,500	260,415	23,530	17,957	84,335	44,598	490	.....	.....	.....
Powell	119,910	10,763	.....	1,569	12,285	4,275	1,475	89,500	4,434	4,243	18,065	36,626	3,730	48,394	.....	.....
Ravalli	102,342	44,000	.....	790	25,720	9,950	1,225	163,386	8,519	7,238	22,240	43,578	7,820	143,753	.....	.....
Rosebud	12,264	.....	.....	1,856	21,252	5,520	475	68,420	8,547	12,858	.....	23,482	.....	.....	.....	.....
Silver Bow	466,545	551,740	111,000	16,685	214,305	34,110	35,700	1,782,795	225,605	2,690	725,485	71,745	140	4,345	.....	.....
Sweet Grass	32,501	4,000	.....	510	15,229	6,625	1,935	88,375	6,540	8,695	8,540	17,110	.....	3,000	.....	.....
Teton	61,780	.....	.....	100	13,759	2,258	835	96,813	4,795	8,035	7,000	26,957	.....	350	.....	.....
Valley	39,206	.....	.....	2,562	22,041	4,809	1,878	86,612	9,313	3,373	6,901	25,567	2,570	65	.....	.....
Yellowstone	71,867	75,000	.....	4,580	81,569	18,155	5,745	466,010	39,160	15,280	49,983	44,305	.....	250	.....	.....
Totals	2,725,678	1,617,210	434,065	98,317	1,457,401	307,445	133,993	7,496,604	707,506	353,270	2,814,708	1,259,161	102,211	943,083	40	.....

ASSESSED VALUATIONS.

TABLE SHOWING THE ASSESSED VALUATION OF CERTAIN CLASSES OF PERSONAL PROPERTY IN EACH COUNTY AFTER EQUALIZATION BY COUNTY BOARDS OF EQUALIZATION FOR THE YEAR 1902—Continued.

(Taken from the Report of the State Board of Equalization.)

Tracing No...	Ice.....	Solvent Cred-its	Money.....	Notes.....	Bank Stock...	Ore	Tailings	Insurance Premiums....	Net Proceeds of Mines.....	Other Per-sonal Prop-erty.....	Steamboats...	Improvements on Governm't Land	Total	Cattle.....	Total Personal Except Sheep, Horses, Hogs, Goats and Buffaloes
1	45,850	18,423	.....	49,558	.....	.....	24,815	2,582	26,476	.....	.....	549,821	1,400,852	1,950,673
2	32,695	.....	.....	25,000	.....	.....	3,909	16,192	2,433	.....	.....	273,347	485,772	759,119
3	62,583	2,450	.....	.....	.....	.....	.....	.....	31,106	.....	.....	529,429	1,032,999	1,562,428
4	59,528	14,143	.....	10,000	.....	.....	.....	64,479	263,448	.....	.....	2,236,862	1,510,649	3,747,511
5	34,500	19,300	.....	215,160	.....	.....	21,576	.....	85	.....	.....	762,692	3,377,259	4,139,951
6	31,410	31,168	.....	192,500	.....	.....	.....	.....	17,565	.....	.....	657,643	2,979,871	3,637,514
7	30,480	.....	.....	.....	.....	.....	.....	.....	615	.....	.....	235,539	2,172,146	2,507,685
8	47,250	48,998	.....	65,790	.....	.....	33,670	.....	55,913	.....	.....	1,482,104	107,537	1,589,691
9	34,432	3,250	.....	211,684	.....	.....	.....	.....	318,210	.....	.....	1,060,385	3,069,003	4,129,388
10	635	.....	.....	97,035	.....	.....	19,309	.....	2,800	3,850	.....	843,307	426,868	1,270,175
11	46,385	33,950	.....	128,550	.....	.....	15,630	.....	24,650	.....	.....	1,007,700	851,235	1,858,935
12	1,060	12,100	11,374	.....	.....	.....	.....	6,709	.....	1,693	.....	.....	485,066	286,886	771,952
13	50,600	37,757	.....	30,000	.....	.....	8,619	.....	12,430	.....	.....	646,522	393,823	1,040,345
14	110,864	116,907	.....	622,831	293,355	.....	127,090	213,800	.....	.....	.....	3,948,737	1,047,840	4,996,577
15	469,860	34,910	.....	77,900	.....	.....	.....	19,665	6,295	.....	.....	1,179,715	1,262,120	2,441,895
16	45,575	12,725	.....	100,000	.....	.....	13,711	.....	4,590	.....	.....	467,555	1,512,638	1,980,193
17	4,208	14,797	.....	159,850	.....	.....	.....	.....	65,947	.....	.....	1,609,996	499,316	2,169,312
18	22,230	1,020	114,115	.....	.....	16,376	30,000	84,646	.....	.....	874,411	778,615	1,653,026
19	15,734	18,674	.....	53,620	.....	.....	3,290	.....	28,889	.....	.....	475,466	703,736	1,179,202
20	45,987	22,110	.....	45,386	.....	.....	4,773	.....	2,645	.....	.....	701,462	521,357	1,222,819
21	14,625	9,225	.....	.....	.....	.....	.....	.....	12,200	.....	.....	190,724	2,037,162	2,227,886
22	1,061,850	697,625	.....	599,190	.....	.....	140,580	5,544,640	152,150	.....	.....	12,438,925	237,780	12,676,705
23	69,011	2,000	.....	.....	.....	.....	.....	.....	12,095	.....	.....	276,166	1,304,198	1,580,364
24	80	22,800	1,400	.....	.....	.....	.....	9,361	.....	4,125	.....	.....	260,448	1,384,402	1,644,850
25	19,199	5,758	.....	.....	.....	.....	5,427	.....	.....	.....	.....	229,341	1,273,009	1,502,350
26	15,335	.....	.....	154,091	.....	.....	29,808	.....	1,490	.....	.....	1,072,577	1,804,392	2,876,969
..	1,140	2,383,496	1,179,174	1,020	2,952,310	293,355	.....	484,653	5,891,358	1,132,603	3,850	.....	34,556,000	32,561,515	67,117,515

ASSESSED VALUATIONS.

TABLE SHOWING THE NUMBER AND ASSESSED VALUATION OF CATTLE BY COUNTIES FOR THE YEAR 1901.
(Taken from the Report of the State Board of Equalization.)

COUNTIES	BEEF CATTLE		YEARLINGS		TWO-YEAR OLDS		THREE-YEAR-OLDS		COWS		STOCK CATTLE	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Beaverhead	2,730	102,345	9,020	135,295	5,650	113,000	.....	.....	939	28,170	17,173	377,806
Broadwater	65	2,225	2,396	36,057	.....	.....	.....	.....	694	20,830	7,193	158,942
Carbon .....	.....	.....	4,780	71,730	.....	.....	2,415	48,300	1,463	43,890	12,919	284,218
Cascade	110	3,475	2,877	43,284	716	14,279	9	340	2,481	74,505	30,345	689,843
Choteau	1,959	60,020	.....	.....	.....	.....	.....	.....	644	19,320	58,908	1,295,974
Custer	2,902	116,100	1,181	17,611	5,100	93,098	4,797	140,102	1,446	41,219	41,654	977,702
Lawson	1,879	62,770	3,153	49,380	4,872	96,910	.....	.....	539	15,575	31,170	744,569
Boer Lodge	25	875	.....	.....	.....	.....	.....	.....	853	25,590	1,361	29,690
Fergus .....	.....	.....	3,184	47,790	.....	.....	.....	.....	460	13,800	37,578	826,716
Flathead .....	.....	.....	1,842	27,635	659	13,455	144	4,035	2,080	66,520	6,111	144,917
Gallatin	97	3,260	5,922	88,830	.....	.....	.....	.....	2,409	72,090	13,767	300,565
Granite .....	.....	.....	2,432	36,487	1,475	29,500	111	3,330	881	26,440	4,271	92,803
Jefferson	89	3,570	3,469	52,035	1,992	39,440	411	12,330	1,123	33,690	5,372	134,335
Lewis and Clarke	184	6,325	4,928	74,320	643	13,080	.....	.....	2,513	75,740	15,510	341,265
Madison	555	23,015	2,125	32,155	272	5,640	31	970	1,516	47,905	25,288	558,385
Meagher	156	5,610	3,807	57,605	.....	.....	.....	.....	698	22,565	18,365	404,151
Missoula	49	1,906	.....	.....	.....	.....	.....	.....	1,899	56,350	13,688	315,684
Park	40	1,450	413	6,255	9	182	.....	.....	1,491	44,900	12,462	274,843
Powell	209	7,115	.....	.....	.....	.....	.....	.....	777	26,325	16,220	353,901
Ravalli	482	16,870	3,604	54,060	2,971	59,420	.....	.....	2,333	69,990	4,132	92,645
Rosebud .....	.....	.....	957	14,350	1,936	42,624	22	584	442	12,880	36,066	719,797
Silver Bow	137	5,255	744	10,695	392	7,885	139	3,885	1,915	62,825	1,382	31,915
Sweet Grass	98	3,315	232	3,712	.....	.....	.....	.....	266	6,916	17,909	395,978
Teton	189	5,970	1,393	20,835	825	16,500	177	4,910	1,225	30,625	16,387	368,712
Valley	130	3,960	515	8,218	157	4,008	.....	.....	271	8,120	21,549	476,477
Yellowstone	43	1,460	1,430	21,740	570	11,470	28	616	1,106	33,160	23,485	516,927
Totals	12,128	436,740	60,424	910,739	28,239	560,421	8,289	219,402	32,554	979,940	490,353	10,908,751

ASSESSED VALUATIONS.

TABLE SHOWING THE NUMBER AND ASSESSED VALUATION OF CATTLE BY COUNTIES FOR THE YEAR 1902.
(Taken from the Report of the State Board of Equalization.)

COUNTIES	BEEF			YEARLINGS			TWO-YEAR-OLDS			BULLS		
	No.	Value Per Head	Total Value	No.	Val. Per Head	Total Value	No.	Value Per Head	Total Value	No.	Val. Per Head	Total Value
Beaverhead	3,448	\$40 00	\$131,985 00	9,227	\$15 00	\$138,105 00	8,615	\$20 00	\$176,590 00	.....	.....	.....
Broadwater	9	35 56	320 00	2,444	16 50	40,325 00	.....	.....	.....	.....	.....	.....
Carbon .....	.....	.....	.....	5,974	15 00	89,610 00	3,317	20 00	66,340 00	.....	.....	.....
Cascade	815	30 05	24,495 00	2,481	15 07	37,385 00	1,213	20 45	24,310 00	.....	.....	.....
Choteau	3,329	30 00	99,870 00	.....	.....	.....	.....	.....	.....	38,864 00	.....	\$2,740 00
Custer	10,475	38 03	398,435 00	1,484	14 94	22,182 00	10,199	21 30	217,252 00	.....	.....	.....
Dawson	2,805	34 67	97,260 00	5,484	14 90	81,635 00	6,603	20 00	131,010 00	.....	.....	.....
Deer Lodge	61	38 44	2,345 00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fergus .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Flathead .....	.....	.....	.....	1,907	15 41	29,395 00	875	22 40	17,710 00	.....	.....	.....
Gallatin	591	30 00	17,930 00	6,136	15 00	92,040 00	.....	.....	.....	.....	.....	.....
Granite	30	36 00	1,080 00	2,900	15 00	43,470 00	1,515	20 00	30,300 00	.....	.....	.....
Jefferson	190	38 60	7,335 00	3,345	15 00	50,175 00	2,274	20 00	45,480 00	.....	.....	.....
Lewis and Clarke	254	37 82	9,625 00	5,144	15 61	80,300 00	685	20 28	13,895 00	.....	.....	.....
Madison	562	37 80	21,270 00	1,830	15 00	27,510 00	1,194	20 40	24,455 00	.....	.....	.....
Meagher	353	40 00	14,120 00	4,640	16 01	74,310 00	1,548	20 00	30,970 00	.....	.....	.....
Missoula	112	36 96	4,140 00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Park	143	33 00	4,770 00	1,497	15 00	22,410 00	85	23 00	1,955 00	10	50 00	500 00
Powell	539	35 00	18,895 00	3,897	15 00	58,455 00	343	20 00	6,860 00	.....	.....	.....
Ravalli	448	39 25	17,585 00	3,669	15 00	55,035 00	2,478	20 00	49,560 00	.....	.....	.....
Rosebud .....	.....	.....	.....	4,583	15 00	71,602 00	11,300	16 00	185,146 00	.....	.....	.....
Silver Bow	14	62 85	880 00	683	17 21	11,760 00	428	20 42	8,740 00	.....	.....	.....
Sweet Grass	231	32 19	7,590 00	655	15 00	9,825 00	.....	.....	.....	.....	.....	.....
Teton	113	50 21	5,675 00	461	15 00	6,915 00	847	20 00	16,940 00	.....	.....	.....
Valley .....	.....	.....	.....	604	15 00	9,387 00	526	21 00	11,181 00	84	44 00	3,755 00
Yellowstone	62	35 00	2,170 00	5,043	15 00	75,645 00	1,971	20 00	39,420 00	.....	.....	.....
Total.....	24,584	.....	\$887,745 00	74,088	.....	\$1,127,476 00	56,016	.....	\$1,098,614 00	132	.....	\$6,995 00

ASSESSED VALUATIONS.

ASSESSED VALUATION OF CATTLE, BY COUNTIES—Continued.
(Taken from the Report of the State Board of Equalization.)

COUNTIES	THREE YEAR-OLDS			THOROUGHBREDS			COWS			STOCK CATTLE		
	No.	Value Per Head	Total Value	No.	Value Per Head	Total Value	No.	Value Per Head	Total Value	No.	Value Per Head	Total Value
Beaverhead										997	\$30 00	\$29,485 00
Broadwater										697	35 22	20,945 00
Carbon										1,306	30 00	39,180 00
Cascade										2,321	30 21	70,126 00
Chouteau										826	30 00	24,780 00
Cluster										1,913	28 79	55,073 00
Custer										259	30 00	7,830 00
Deer Lodge										803	30 00	24,090 00
Fergus										166	30 00	4,980 00
Flathead										2,424	31 33	75,725 00
Gallatin										2,468	30 00	74,040 00
Granite										772	30 00	23,162 00
Jefferson	364	\$30 00	10,920 00							1,114	30 03	33,760 00
Lewis and Clarke										2,273	29 81	67,855 00
Madison										1,573	30 00	47,295 00
Meagher							60	\$51 75	\$3,105 00	1,685	30 73	51,050 00
Missoula										1,912	29 68	56,765 00
Park										1,603	30 00	48,090 00
Powell	6	25 00	150 00				50	30 00	1,500 00	697	30 00	24,395 00
Ravalli										2,534	30 00	76,020 00
Rosebud	7,096	26 13	185,450 00							1,936	29 00	56,003 00
Silver Bow	115	24 91	2,865 00							2,031	31 73	64,445 00
Sweet Grass										245	30 00	7,350 00
Teton										91	30 00	2,730 00
Valley										319	30 00	9,570 00
Yellowstone										1,141	30 00	34,230 00
Total	7,581		\$194,385 00	110		\$4,695 00			\$1,001,494 00	555,383		\$12,887,070 00

ASSESSED VALUATIONS.

TABLE SHOWING THE NUMBER AND ASSESSED VALUATION OF SHEEP BY COUNTIES FOR THE YEAR 1901.

(Taken from the Report of the State Board of Equalization.)

COUNTIES	STOCK SHEEP		LAMBS		RAMS	
	No.	Value	No.	Value	No.	Value
Beaverhead	126,724	316,810	1,000	3,000	1,328	6,640
Broadwater	23,475	110,007	.....	10,875	209	1,045
Carbon	133,120	332,825	.....	.....	.....	.....
Cascade.....	158,779	396,949	.....	.....	814	6,362
Choteau	519,775	1,479,438	32,640	65,280	5,146	31,605
Custer	223,360	608,016	.....	.....	202	800
Dawson	194,950	495,478	.....	.....	.....	.....
Deer Lodge	2,600	6,600	.....	.....	.....	.....
Fergus	625,155	1,562,888	.....	.....	4,982	24,910
Flathead	646	1,610	.....	.....	.....	.....
Gallatin	25,457	72,510	.....	.....	.....	.....
Granite	6,546	16,366	.....	.....	.....	.....
Jefferson.....	4,912	14,196	3,472	8,680	45	185
Lewis & Clarke	83,020	207,550	.....	.....	.....	.....
Madison	60,510	158,015	2,545	4,365	181	1,905
Meagher	291,625	729,110	27,950	69,875	3,698	22,470
Missoula	8,478	21,281	.....	.....	.....	.....
Park	85,726	213,996	.....	.....	.....	.....
Powell	78,563	196,931	.....	.....	.....	.....
Ravalli	37,271	93,176	.....	.....	232	1,160
Rosebud	127,910	368,059	.....	.....	1,016	6,388
Silver Bow	1,500	3,600	.....	.....	.....	.....
Sweet Grass	198,386	495,966	95,340	190,740	137	725
Teton	269,310	673,275	4,700	9,400	90	450
Valley	160,290	398,349	22,958	45,516	1,418	7,090
Yellowstone	266,948	642,476	28,410	71,025	4,859	24,295
Total	3,807,036	9,615,477	223,395	478,756	24,357	136,030

TABLE SHOWING THE NUMBER AND ASSESSED VALUATION OF SHEEP IN MONTANA BY COUNTIES FOR THE YEAR 1902.

COUNTIES	STOCK SHEEP			LAMBS			RAMS		
	No.	Val. Per Head	Total Value	No.	Val. Per Head	Total Value	No.	Val. Per Head	Total Value
Beaverhead	109,806	\$2 50	\$274,514	30,648	\$2 00	\$61,296	1,339	\$5 00	\$6,720
Broadwater	43,675	2 47	107,762	6,960	2 00	13,920	770	5 00	3,750
Carbon	275,070	2 50	282,120	10,120	2 00	20,240	.....	.....	.....
Cascade	115,561	2 27	262,507	41,400	2 00	82,800	795	5 15	4,095
Choteau	652,524	2 25	1,468,179	58,550	2 00	117,100	7,031	5 75	40,320
Custer	274,138	2 78	763,465	.....	.....	.....	.....	.....	.....
Dawson	288,555	2 50	719,849	.....	.....	.....	3,042	4 83	14,690
Deer Lodge	2,900	2 53	7,350	.....	.....	.....	.....	.....	.....
Fergus	681,646	2 25	1,533,703	.....	.....	.....	6,662	5 00	33,310
Flathead	565	2 50	1,335	.....	.....	.....	.....	.....	.....
Gallatin	18,020	2 50	45,120	8,700	2 00	17,400	649	5 00	3,245
Granite	9,146	2 50	22,866	.....	.....	.....	.....	.....	.....
Jefferson	4,928	3 00	14,784	3,504	2 50	8,760	31	6 53	202
Lewis & Clarke ...	107,414	2 48	267,510	4,800	2 25	10,800	.....	.....	.....
Madison	69,257	2 50	176,185	7,577	2 00	15,155	258	8 00	2,015
Meagher	238,015	2 50	595,059	114,210	2 00	228,420	4,241	5 89	24,975
Missoula	10,353	2 39	24,677	.....	.....	.....	.....	.....	.....
Park	79,950	2 50	199,875	18,350	2 00	36,700	4	50 00	200
Powell	59,005	2 50	147,552	13,000	2 00	26,000	330	2 50	825
Ravalli	26,103	2 50	65,256	17,740	2 00	35,480	210	5 00	1,050
Rosebud	159,721	2 50	399,303	.....	.....	.....	2,346	3 30	7,688
Silver Bow	3,200	2 45	7,850	.....	.....	.....	.....	.....	.....
Sweet Grass	200,451	2 50	501,128	109,650	2 00	219,300	10	2 50	25
Teton	237,643	2 50	594,111	37,015	2 00	74,030	139	3 00	417
Valley	220,390	2 25	495,884	15,531	2 00	31,062	1,778	5 00	8,890
Yellowstone	215,280	2 50	538,200	87,872	2 25	197,712	1,030	5 00	5,150
Total	4,103,318	.....	\$9,516,144	585,627	.....	\$1,196,175	30,665	.....	\$157,567

ASSESSED VALUATIONS.

TABLE SHOWING THE NUMBER AND ASSESSED VALUATION OF HORSES,
BY COUNTIES FOR THE YEAR 1901.

(Taken from the Report of the State Board of Equalization.)

COUNTIES	THOROUGHbred		RANGE		COMMON	
	No.	Value	No.	Value	No.	Value
Beaverhead .....	.....	2,730	5,493	54,930	2,370	59,240
Broadwater	65	4,110	3,662	37,005	1,440	48,615
Carbon	16	1,720	4,661	46,630	2,834	84,793
Cascade	25	2,160	5,001	55,765	4,261	146,306
Choteau	33	3,600	7,303	104,033	3,767	151,610
Custer .....	.....	.....	16,246	237,141	3,511	84,254
Dawson	75	7,875	11,129	242,340	1,283	47,248
Deer Lodge	11	1,275	1,046	10,460	974	26,355
Fergus	22	2,750	8,571	128,565	4,107	160,195
Flathead	11	1,700	2,084	29,486	2,369	76,120
Gallatin	24	3,150	4,121	43,560	5,485	165,355
Granite	14	1,775	2,221	22,205	900	41,693
Jefferson	6	540	1,965	19,650	1,710	55,860
Lewis and Clarke	19	2,150	3,893	48,425	2,715	78,113
Madison	526	39,045	8,176	88,385	3,493	113,095
Meagher	13	1,200	3,241	33,825	1,575	47,910
Missoula	14	1,365	1,462	14,805	2,484	77,535
Park	13	1,250	2,983	45,592	2,078	87,495
Powell	49	3,575	3,554	46,995	1,945	59,880
Ravalli	167	20,200	2,129	31,935	2,690	80,113
Rosebud .....	.....	.....	12,612	178,904	1,358	36,319
Silver Bow	28	3,300	883	9,450	2,311	33,900
Sweet Grass	7	625	1,495	14,950	1,828	42,934
Teton	4	1,100	8,555	85,550	2,052	51,325
Valley	18	1,190	3,653	48,729	1,939	53,589
Yellowstone	39	3,450	5,230	78,460	3,095	105,735
Totals	1,190	111,835	131,369	1,757,765	64,574	2,065,587

ASSESSED VALUATIONS.

TABLE SHOWING THE ASSESSED VALUATION OF HORSES, BY COUNTIES FOR THE YEAR 1902.
(Taken from the Report of the State Board of Equalization.)

COUNTIES	THOROUGHBRED			RANGE			COMMON			JACKS		
	No.	Value Per Head	Total Value	No.	Value Per Head	Total Value	No.	Value Per Head	Total Value	No.	Value Per Head	Total Value
Beaverhead	52	\$145 03	\$7,535 00	5,282	\$15 00	\$79,390 00	2,435	\$30 00	\$74,800 00	.....	.....	.....
Broadwater	61	70 58	4,305 00	3,305	14 80	48,905 00	1,325	38 33	49,780 00	.....	.....	.....
Carbon	15	116 00	1,725 00	4,710	15 00	70,650 00	2,845	25 00	81,720 00	.....	.....	.....
Cascade	27	103 17	2,785 00	3,518	15 22	53,565 00	4,767	34 74	165,610 00	.....	.....	.....
Choteau	61	100 00	6,115 00	7,826	15 00	121,223 00	4,000	43 00	171,870 00	.....	.....	.....
Custer	99	128 03	12,675 00	14,358	18 30	262,766 00	3,911	31 29	122,385 00	.....	.....	.....
Dawson	78	104 80	8,175 00	11,597	22 28	258,372 00	854	42 90	36,645 00	.....	.....	.....
Deer Lodge	26	103 85	2,700 00	963	15 00	14,475 00	784	27 00	21,090 00	.....	.....	.....
Fergus	30	125 00	3,450 00	9,435	20 00	188,700 00	3,946	43 75	173,165 00	.....	.....	.....
Flathead	11	170 45	1,875 00	2,099	16 15	33,925 00	2,764	30 68	84,810 00	.....	.....	.....
Gallatin	205	70 00	14,400 00	3,744	10 00	39,710 00	5,473	29 00	162,930 00	.....	.....	.....
Granite	18	76 01	1,370 00	1,589	15 00	23,840 00	1,129	35 00	39,475 00	.....	.....	.....
Jefferson	68	85 00	5,780 00	1,977	10 63	21,010 00	1,650	33 67	55,585 00	.....	.....	.....
Lewis & Clarke	25	141 00	3,525 00	4,076	15 91	64,820 00	2,988	30 80	92,000 00	.....	.....	.....
Madison	521	73 45	38,100 00	8,203	15 00	125,765 00	3,569	15 00	53,535 00	.....	.....	.....
Meagher	18	95 83	1,725 00	3,162	15 00	47,425 00	1,520	36 91	56,100 00	.....	.....	.....
Missoula	14	107 50	1,505 00	1,881	15 38	28,745 00	2,343	34 19	80,085 00	.....	.....	.....
Park	14	100 00	1,400 00	3,450	17 00	58,290 00	1,950	46 00	90,095 00	.....	.....	.....
Powell	55	94 63	5,205 00	3,705	16 00	43,280 00	1,821	30 72	55,955 00	2	\$130 00	\$260 00
Ravalli	49	100 00	4,900 00	1,197	15 00	29,955 00	2,800	30 87	86,435 00	.....	.....	.....
Rosebud .....	.....	.....	.....	8,341	14 00	121,046 00	1,945	30 00	58,366 00	.....	.....	.....
Silver Bow	36	106 25	3,825 00	805	15 01	12,085 00	2,353	37 71	89,870 00	.....	.....	.....
Sweet Grass	10	142 50	1,425 00	1,385	15 00	20,775 00	1,954	26 81	52,440 00	.....	.....	.....
Teton	3	400 00	1,200 00	5,607	15 00	84,105 00	1,993	34 92	69,605 00	.....	.....	.....
Valley	27	63 00	1,715 00	3,714	14 00	55,708 00	1,926	31 00	60,780 00	.....	.....	.....
Yellowstone	38	92 10	3,500 00	5,711	15 00	85,665 00	2,345	34 50	80,800 00	.....	.....	.....
Total	1,561	.....	\$141,215 00	121,640	.....	\$1,994,195 00	65,420	.....	\$2,237,921 00	2	.....	\$260 00

ASSESSED VALUATIONS.

TABLE SHOWING THE ASSESSED VALUATION OF ANGORA GOATS, BUFFALOES, AND HOGS BY COUNTIES FOR THE YEAR 1901.
(Taken from the Report of the State Board of Equalization.)

COUNTIES	ANGORA GOATS		BUFFALOES		HOGS	
	No.	Value	No.	Value	No.	Value
Beaverhead					184	920
Broadwater					394	2,041
Carbon					731	3,496
Cascade					323	1,615
Choteau					118	590
Custer					8	63
Dawson					42	241
Deer Lodge					111	555
Fergus					485	2,425
Flathead					1,056	5,280
Gallatin					1,539	10,060
Granite					183	915
Jefferson.. ..					196	1,195
Lewis and Clarke		1,510			603	3,100
Madison					1,017	5,980
Meagher					163	845
Missoula				25,000	827	2,831
Park					698	3,490
Powell					99	515
Ravalli					1,376	6,377
Rosebud ..					50	275
Silver Bow					217	1,715
Sweet Grass		75			121	611
Teton					45	218
Valley					26	130
Yellowstone					350	1,792
Totals		1,585		25,000	10,962	57,774

TABLE SHOWING THE ASSESSED VALUATION OF ANGORA GOATS, BUFFALOES, AND HOGS BY COUNTIES FOR THE YEAR 1902.

COUNTIES	HOGS			BUFFALOES			ANGORA GOATS		
	No.	Per Head	Total Value	No.	Per Head	Total Value	No.	Per Head	Total Value
Beaverhead	187	\$5 00	\$937 00						
Broadwater ..	363	6 04	2,190 00						
Carbon	691	5 00	3,455 00						
Cascade	471	5 00	2,325 00	14	\$60 00	\$840 00			
Choteau	195	5 00	975 00						
Custer	10	5 00	50 00						
Dawson							220	\$3 00	\$660 00
Deer Lodge ..	137	5 00	685 00						
Fergus	603	5 00	3,015 00						
Flathead	1,288	5 00	6,440 00			1,000 00	35	2 50	\$7 00
Gallatin	1,562	5 00	7,815 00						
Granite	138	5 00	690 00				134	4 00	536 00
Jefferson	258	5 76	1,491 00						
Lewis and Clarke	551	5 00	2,755 00				110	3 00	330 00
Madison	987	6 00	5,960 00						
Meagher	207	5 17	1,071 00				18	2 95	53 00
Missoula	566	4 82	2,729 00	170	250 00	37,500 00			
Park	678	5 00	3,390 00						
Powell	156	5 00	780 00				91	3 13	285 00
Ravalli	1,492	5 00	7,460 00						
Rosebud	34	5 00	170 00						
Silver Bow	49	7 50	3,730 00						
Sweet Grass	157	5 00	785 00				535	2 50	1,338 00
Teton.. ..	36	5 00	180 00						
Valley	25	5 00	125 00						
Yellowstone	306	5 00	1,525 00						
Total	11,594		\$60,728 00	164		\$39,340 00	1,143		\$3,288 00

ASSESSED VALUATIONS.
TABLE SHOWING THE ASSESSED VALUATION OF RAILROADS AFTER EQUALIZATION BY THE STATE BOARD
OF EQUALIZATION FOR THE YEAR 1901
(Taken from the Report of the State Board of Equalization.)

	Franchise	Roadway	Roadbed	Rails	Rolling Stock	Total Per Mile	Mileage	Total Valuation
Big Horn Southern	\$87.50	\$150.00	\$1,375.00	\$1,375.00	\$600.00	\$3,587.50	101.74	\$364,992.25
Butte, Anaconda & Pacific	200.00	350.00	2,500.00	2,500.00	2,650.00	8,200.00	25.9	212,380.00
Spurs	150.00	350.00	2,500.00	2,000.00	1,150.00	6,150.00	29.22	179,763.00
Stuart Branch	100.00	250.00	1,650.00	1,650.00	450.00	4,100.00	8.4	34,440.00
Great Falls & Canada	35.25	100.00	600.00	600.00	110.00	1,445.25	133.9	193,518.97
Great Northern	132.50	300.00	1,800.00	1,800.00	1,400.00	5,432.50	423.4	2,300,120.50
Pacific Extension	132.50	300.00	1,800.00	1,800.00	1,400.00	5,432.50	384.5	2,688,796.25
O'Brien Spur	25.00	300.00	300.00	300.00	100.00	1,025.00	10.17	10,424.25
Montana Central	187.50	350.00	2,750.00	2,500.00	1,900.00	7,687.50	172.55	1,326,478.13
Barker Branch	25.00	100.00	400.00	400.00	100.00	1,025.00	10.79	11,059.75
Fair Ground	25.00	100.00	450.00	450.00	.....	1,025.00	.85	871.25
Neihart	106.25	250.00	1,600.00	1,600.00	800.00	4,356.25	56.24	244,995.50
Red Mountain	25.00	100.00	450.00	450.00	.....	1,025.00	1.47	1,506.75
Sand Coulee	162.50	300.00	2,200.00	2,200.00	1,800.00	6,662.50	19.73	131,451.12
Montana Railroad	30.00	100.00	500.00	500.00	100.00	1,230.00	94.66	116,431.80
Northern Pacific (Main Line) .....	.....	307.50	2,050.00	2,050.00	1,537.50	5,945.00	783.041	4,655,178.75
Bitter Root	125.00	300.00	1,900.00	1,900.00	900.00	5,125.00	56.384	288,968.00
Boulder	75.00	300.00	1,200.00	1,200.00	300.00	3,075.00	35.2071	198,261.53
Butte Line	145.00	300.00	2,000.00	2,000.00	1,500.00	5,945.00	70.8771	421,363.76
Clark's Fork	100.00	300.00	2,000.00	2,000.00	1,200.00	4,100.00	19.4391	79,699.90
Coeur d'Alene	125.00	300.00	1,250.00	1,250.00	1,200.00	5,125.00	109.517	561,274.63
Cokedale	25.00	200.00	400.00	400.00	.....	1,025.00	3.619	3,709.48
Elkhorn	25.00	100.00	300.00	300.00	300.00	1,025.00	20.125	20,628.12
Gaylord & Ruby Valley	100.00	150.00	1,650.00	1,650.00	550.00	4,100.00	26.322	107,920.20
Marysville	125.00	350.00	1,800.00	1,800.00	1,650.00	5,125.00	12.532	64,226.50
Montana Union	145.00	300.00	2,000.00	2,000.00	1,500.00	5,945.00	51.2	304,384.00
Montana Union—Butte Hill Branch ..	75.00	250.00	1,000.00	1,000.00	750.00	3,075.00	12.0	36,900.00
Park	125.00	300.00	1,900.00	1,900.00	900.00	5,125.00	51.454	263,701.75
Philipsburg	112.50	300.00	1,700.00	1,700.00	800.00	4,612.50	32.121	148,158.11
Pony	75.00	200.00	1,300.00	1,300.00	200.00	3,075.00	7.092	21,807.99
Red Bluff Branch	75.00	200.00	1,300.00	1,300.00	200.00	3,075.00	20.895	64,252.12
Red Mountain Branch	37.50	100.00	600.00	600.00	200.00	1,537.50	15.436	23,732.85
Rocky Fork Branch	125.00	250.00	1,900.00	1,950.00	900.00	5,125.00	44.373	227,411.62
Wickes	37.50	100.00	700.00	700.00	.....	1,537.50	5.118	7,868.92
Oregon Short Line	162.50	350.00	2,350.00	2,500.00	1,300.00	6,662.50	126.4	842,140.00
Yellowstone Park Ry	37.50	100.00	700.00	700.00	.....	1,537.50	11.	16,912.50
Totals .....	.....	.....	.....	.....	.....	.....	2,987,672	\$15,485,671.16

TABLE SHOWING THE ASSESSED VALUATION OF RAILROADS AFTER EQUALIZATION BY THE STATE BOARD OF EQUALIZATION FOR THE YEAR 1902.

	Franchise	Rightway	Roadbed	Rails	Rolling Stock	Value Per Mile	Mileage	Valuation of Main Line	Mileage of Side Tracks	Value Per Mile	Total Value of Side Tracks	Total Value
Big Horn Southern	\$120 00	\$184 00	\$1,680 00	\$1,680 00	\$736 00	\$4,400 00	101.74	\$447,656	15.12	\$440 00	\$6,652	\$454,308
Butte, Anaconda & Pacific ..	320 00	560 00	4,880 00	2,400 00	4,640 00	12,800 00	25.9	231,520	35.15	1,280 00	44,992	376,512
Spurs	240 00	560 00	4,000 00	1,600 00	3,440 00	9,840 00	22.04	216,874	20.15	984 00	19,828	236,702
Stuart Branch	160 00	400 00	3,440 00	1,680 00	880 00	6,560 00	8.4	55,104	9.46	656 00	6,206	61,310
Chicago, Burlington & Quincy	100 50	180 00	1,132 00	1,175 00	1,000 00	3,587 50	85.54	306,875	5.39	358 00	1,930	308,805
Great Falls & Canada	70 50	200 00	1,200 00	1,200 00	220 00	2,890 50	133.9	387,038	5.95	289 00	1,720	388,758
Jennings Branch	75 00	125 00	1,000 00	1,000 00	300 00	2,500 00	50.98	127,450	4.73	250 00	1,182	128,632
Great Northern	312 00	708 00	5,360 00	2,000 00	4,420 00	12,800 00	418.89	5,361,792	*	*	.....	5,361,792
Pacific Extension	312 00	708 00	5,360 00	2,000 00	4,420 00	12,800 00	384.5	4,921,600	128.26	1,280 00	164,173	5,085,773
O'Brien Spur	50 00	600 00	600 00	600 00	200 00	2,050 00	10.32	21,156	.65	205 00	133	21,289
Montana Central	312 00	708 00	5,360 00	2,000 00	4,420 00	12,800 00	172.35	2,208,640	33.2	1,280 00	42,496	2,251,136
Parker Branch	25 00	100 00	400 00	400 00	100 00	1,025 00	10.79	11,060	.37	102 00	37	11,097
Fair Ground Branch	25 00	100 00	325 00	.....	.....	450 00	.85	385	.....	.....	.....	385
Norhart Branch	120 00	280 00	1,840 00	1,840 00	920 00	5,000 00	56.24	281,200	8.2	500 00	4,100	285,300
Red Mountain Branch	25 00	100 00	450 00	450 00	.....	1,025 00	1.47	1,507	.....	.....	.....	1,507
Sand Coulee Branch	120 00	360 00	3,840 00	1,440 00	2,240 00	8,000 00	19.73	157,840	6.0	800 00	4,800	162,640
Montana Railroad	70 00	200 00	1,015 00	1,015 00	200 00	2,500 00	95.66	236,650	4.745	250 00	1,186	237,836
Northern Pacific .....	.....	665 00	5,612 00	2,075 00	4,448 00	12,800 00	783.041	10,022,925	150.408	1,280 00	192,522	10,215,447
Fitter Root Branch	275 00	660 00	5,420 00	1,636 00	3,245 00	11,290 00	56.384	631,500	5.567	1,120 00	6,224	637,724
Boulder Branch	75 00	300 00	1,200 00	1,200 00	300 00	3,075 00	35.207	108,261	1.484	307 00	455	108,716
Butte Line	312 00	708 00	5,360 00	2,000 00	4,420 00	12,800 00	70.877	907,226	6.104	1,280 00	7,813	915,039
Clark's Fork Branch	100 00	300 00	1,250 00	1,250 00	1,200 00	4,100 00	19.439	79,700	.456	410 00	232	79,932
Coeur d'Alene Branch	200 00	392 00	3,684 00	1,440 00	2,284 00	8,000 00	109.517	876,136	11.364	800 00	9,091	885,227
Cokedale	25 00	200 00	400 00	400 00	.....	1,025 00	3.619	3,709	.....	.....	.....	3,709
Eckhorn Branch	90 00	261 00	903 00	873 00	873 00	3,000 00	20.125	60,375	1.212	300 00	363	60,738
Gaylord & Ruby Valley	186 00	183 00	1,980 00	1,980 00	671 00	5,000 00	45.542	227,710	1.627	500 00	813	228,523
Marysville Branch	150 00	410 00	2,265 00	1,540 00	1,635 00	6,000 00	12.332	75,192	1.535	600 00	921	76,113
Montana Union	312 00	708 00	5,360 00	2,000 00	4,420 00	12,800 00	51.2	655,360	10.91	1,280 00	13,964	669,324
Butte Hill Spur	75 00	250 00	1,000 00	1,000 00	750 00	3,075 00	12.0	36,900	2.0	307 00	614	37,514
Park Branch	200 00	392 00	3,684 00	1,440 00	2,284 00	8,000 00	51.454	411,632	1.037	800 00	830	412,462
Philipsburg Branch	112 50	300 00	1,700 00	1,700 00	800 00	4,612 50	32.121	148,158	4.0	461 00	1,844	150,002
Pony Branch	180 00	288 00	1,872 00	1,872 00	288 00	4,500 00	7.092	31,914	.469	450 00	211	32,125
Red Bluff Branch	180 00	288 00	1,872 00	1,872 00	288 00	4,500 00	20.895	94,028	.954	450 00	429	94,477
Res. Mountain Branch	37 50	100 00	600 00	600 00	200 00	1,537 50	15.436	23,733	5.022	153 00	768	24,501
Rocky Fork Branch	200 00	392 00	3,684 00	1,440 00	2,284 00	8,000 00	44.378	354,984	6.492	800 00	5,194	360,108
Wickes Branch	37 50	100 00	700 00	700 00	.....	1,537 50	5.118	7,869	1.257	153 00	192	8,061
Oregon Short Line	312 00	708 00	5,360 00	2,000 00	4,420 00	12,800 00	126.4	1,617,920	21.88	1,280 00	28,006	1,645,926
Yellowstone Park Ry	37 50	100 00	700 00	600 00	100 00	1,537 50	11.0	16,912	1.0	153 00	153	17,065
Totals .....	.....	.....	.....	.....	.....	.....	3,131.872	31,466,491	512.143	.....	\$570,074	\$32,036,565

* Included in Pacific Extension.

ASSESSED VALUATIONS.

TABLE SHOWING THE TOTAL ASSESSED VALUATION OF ALL CLASSES OF PROPERTY IN EACH COUNTY AFTER EQUALIZATION BY STATE AND COUNTY BOARDS OF EQUALIZATION FOR THE YEAR 1901.
(Taken from the Report of the State Board of Equalization.)

COUNTIES	Real Estate	Personal Property	Total	Railroad Valuation	Total Valuation of County
Beaverhead	\$1,812,110 00	\$1,787,666 00	\$3,599,776 00	\$522,873 00	\$4,122,649 00
Broadwater	1,012,490 00	731,732 00	1,744,222 00	253,186 00	1,997,408 00
Carbon	1,177,937 00	1,702,314 00	2,880,251 00	300,060 00	3,180,311 00
Cascade	9,845,912 00	3,439,291 00	13,285,206 00	942,061 00	14,227,267 00
Choteau	1,456,128 00	3,860,422 00	5,316,550 00	1,502,249 00	6,818,799 00
Custer	1,233,643 00	2,905,887 00	4,139,530 00	431,482 00	4,571,012 00
Dawson	573,813 00	1,997,572 00	2,571,385 00	372,567 00	2,943,952 00
Deer Lodge	4,173,019 00	1,629,405 00	5,802,424 00	283,261 00	6,085,685 00
Fergus	2,246,166 00	3,721,856 00	5,968,022 00	.....	5,968,022 00
Flathead	2,768,563 00	1,094,893 00	3,863,456 00	1,096,164 00	4,959,620 00
Gallatin	4,590,705 00	1,691,060 00	6,281,765 00	506,058 00	6,787,823 00
Granite	1,162,704 00	734,890 00	1,897,594 00	312,365 00	2,209,959 00
Jefferson	1,875,681 00	1,002,508 00	2,878,189 00	858,004 00	3,736,193 00
Lewis and Clarke	10,519,090 00	5,174,804 00	15,693,894 00	720,978 00	16,414,872 00
Madison	1,987,115 00	2,278,695 00	4,265,810 00	251,293 00	4,517,103 00
Meagher	1,578,124 00	1,852,324 00	3,430,448 00	86,986 00	3,517,434 00
Missoula	4,236,527 00	2,145,966 00	6,382,493 00	1,763,408 00	8,145,901 00
Park	2,209,792 00	1,449,396 00	3,659,188 00	465,387 00	4,124,575 00
Powell	1,300,114 00	1,156,145 00	2,456,259 00	389,112 00	2,845,371 00
Ravalli	1,812,521 00	1,210,707 00	3,023,228 00	197,646 00	3,220,874 00
Rosebud	642,580 00	1,570,380 00	2,212,960 00	622,260 00	2,835,220 00
Silver Bow	16,830,225 00	21,756,365 00	38,585,590 00	738,712 00	39,324,302 00
Sweet Grass	1,029,343 00	1,408,421 00	2,437,764 00	310,020 00	2,747,784 00
Teton	856,300 00	1,505,888 00	2,362,188 00	673,295 00	3,035,483 00
Valley	238,898 00	1,282,946 00	1,521,844 00	1,108,230 00	2,630,074 00
Yellowstone	2,593,309 00	2,448,572 00	5,041,881 00	778,014 00	5,819,895 00
Total	\$79,762,809 00	\$71,539,113 00	151,301,917 00	\$15,485,671 00	\$166,787,588 00

ASSESSED VALUATIONS.

TABLE SHOWING THE TOTAL ASSESSED VALUATION OF ALL CLASSES OF PROPERTY IN EACH COUNTY AFTER EQUALIZATION BY STATE AND COUNTY BOARDS OF EQUALIZATION FOR THE YEAR 1992.

(Taken from the Report of the State Board of Equalization.)

COUNTIES	Real Estate	PERSONAL PROPERTY		Total	Railroad Valuation	Total Valuation
		Cattle and Sheep	All Other Kinds			
Beaverhead	\$1,994,493	\$1,400,852	\$5,499,821	3,855,166	1,023,598	4,879,659
Broadwater	1,056,017	485,722	273,347	1,815,136	548,284	2,363,420
Carbon	1,210,124	1,022,999	529,429	2,772,552	487,912	3,260,464
Cascade	10,380,110	1,510,649	2,236,862	14,127,621	1,498,883	15,626,504
Chouteau	1,726,028	3,377,259	702,692	5,805,979	3,389,086	9,195,065
Cluster	1,262,993	2,979,871	657,643	4,900,507	935,469	5,835,976
Lawson	617,458	2,272,146	235,537	3,155,143	817,702	3,972,845
Deer Lodge	5,439,297	107,587	1,482,104	7,028,988	543,444	7,572,432
Fergus	2,503,443	3,069,003	1,060,385	6,632,831	.....	6,632,831
Flathead	3,297,229	436,868	943,307	4,577,404	2,739,489	7,316,893
Gallatin	4,892,775	851,235	1,007,700	6,751,710	1,086,036	7,837,746
Granite	1,811,749	286,886	485,066	1,833,701	596,668	2,430,369
Jefferson	1,688,456	393,823	646,522	2,728,801	1,513,982	4,242,783
Lewis and Clarke	10,870,785	1,047,840	3,948,137	15,867,362	1,271,100	17,141,462
Madison	2,197,005	1,262,120	1,179,775	4,638,900	499,423	5,138,323
Meagher	1,539,932	1,512,638	467,555	3,510,125	177,645	3,687,770
Missoula	4,681,554	499,316	1,669,995	6,850,866	3,548,063	10,398,929
Park	2,390,000	778,615	874,411	4,043,026	854,577	4,897,603
Powell	1,302,272	703,736	475,466	2,481,474	855,395	3,336,869
Ravalli	1,981,899	521,357	701,462	3,204,718	437,232	3,641,950
Rosebud	653,855	2,037,162	190,724	2,881,741	1,168,389	4,050,130
Silver Bow	18,585,605	237,780	12,438,925	31,262,310	1,237,690	32,500,000
Sweet Grass	1,080,878	1,304,198	276,166	2,661,242	673,617	3,334,859
Teton	1,101,205	1,384,402	260,448	2,746,055	1,549,935	4,295,990
Valley	291,562	1,273,009	229,341	1,793,912	2,640,640	4,434,552
Yellowstone	2,804,853	1,894,392	1,072,577	5,681,822	1,798,496	7,480,318
Total	\$89,471,577	\$32,561,515	\$34,656,009	153,689,092	32,036,569	185,725,661

TABLE SHOWING CAPITAL STOCK, DEPOSITS AND UNDIVIDED PROFITS, TAKEN FROM THE BANK REGISTER, AND THE SAME ITEMS AS RETURNED FOR ASSESSMENT, FOR THE YEAR 1902.

COUNTIES	ACCORDING TO BANK REGISTER			RETURNED FOR ASSESSMENT		
	Capital Stock	Undivided Profits	Deposits	Money on Hand, or Special Deposits, Solvent Credits (Includes Deposits)		Capital Stock.
Beaverhead	100,000	142,000	1,184,000	45,850	18,423	49,558
Broadwater	25,000	2,050	105,440	32,695	.....	25,000
Carbon	90,000	76,000	320,000	62,583	2,450	.....
Cascade	520,000	89,850	2,320,200	59,428	14,143	10,000
Choteau	275,000	126,830	1,093,400	34,500	19,300	215,160
Custer	130,000	123,320	861,260	31,410	31,168	192,500
Dawson	40,000	82,200	332,830	30,480	.....	.....
Deer Lodge	100,000	15,000	1,494,000	47,250	48,998	65,790
Fergus	275,000	147,500	935,000	34,432	3,250	211,684
Flathead	200,000	33,430	1,087,190	635	.....	97,085
Gallatin	125,000	92,500	996,470	46,385	33,950	128,550
Granite	66,870	.....	42,730	12,100	11,374	.....
Jefferson	30,000	15,000	250,000	50,600	37,757	30,000
Lewis and Clarke	670,000	245,560	4,800,000	110,864	116,907	622,831
Madison	125,000	5,550	549,580	469,860	34,910	77,900
Meagher	100,000	50,690	210,290	45,575	12,725	100,000
Missoula	225,000	102,500	1,402,000	4,208	14,797	159,850
Park	190,000	42,000	902,730	.....	22,230	114,115
Powell	100,000	.....	.....	15,734	18,674	53,620
Ravalli	55,000	.....	.....	45,987	22,110	40,386
Rosebud	6,000	6,900	90,000	14,625	9,225	.....
Silver Bow	600,000	896,710	9,106,710	1,061,850	697,625	599,190
Sweet Grass	50,000	45,000	250,000	69,011	2,000	.....
Teton .....	.....	.....	.....	22,800	1,400	.....
Valley .....	.....	.....	.....	19,199	5,758	.....
Yellowstone	250,000	51,000	1,470,000	15,335	.....	154,091
Total	4,347,870	2,391,590	29,803,830	2,383,496	1,179,174	2,952,310

RECAPITULATION.

Bank Register—		
Capital Stock		\$4,347,870
Undivided Profits		2,391,590
Deposits		29,803,830
Assessment—		
Capital Stock		\$2,952,310
Money on Hand		1,179,174
Deposits		2,383,496
		\$36,543,290
		\$6,514,980

TABLE SHOWING THE GROWTH OF THE STATE AS REFLECTED IN THE ASSESSED VALUATION OF PROPERTY FROM 1890 TO 1902, INCLUSIVE.

YEAR	LANDS OTHER THAN CITY AND TOWN LOTS			TOWN AND CITY LOTS			Railroad Valuation	Total Valuation of the State
	Number of Acres	Total Value	Value of Improvements	Total Value	Total Value of Improvements	Total Value of All Real Estate		
1890	4,930,196	13,031,912	5,340,687	27,288,955	9,617,131	55,278,685	6,523,380	112,916,272
1891	5,402,016	16,641,744	7,991,431	30,965,303	13,499,303	68,698,038	8,181,390	143,472,743
1892	5,737,841	15,854,376	8,225,110	30,240,516	13,865,556	69,307,564	9,287,532	129,466,949
1893	6,065,807	17,219,441	7,260,114	24,388,299	14,356,792	65,094,167	9,933,355	127,518,175
1894	6,523,346	15,675,856	7,463,835	21,193,636	14,418,057	60,744,939	10,062,457	118,850,892
1895	6,558,425	17,020,977	7,926,305	22,036,844	16,084,986	65,297,885	10,455,405	124,076,586
1896	7,726,240	17,069,855	8,100,071	20,843,550	15,980,144	65,331,433	10,403,231	120,697,847
1897	7,886,094	17,821,955	8,667,809	20,615,994	16,743,171	67,175,589	13,674,053	130,757,412
1898	8,210,376	19,119,354	9,500,668	19,451,962	17,495,735	68,548,421	13,793,582	133,969,519
1899	9,123,673	20,499,746	9,937,786	20,000,954	18,639,160	72,514,969	14,992,690	142,117,656
1900	8,877,833	21,416,061	10,091,880	20,888,926	19,006,897	75,173,763	15,000,096	153,401,591
1901	8,601,348	23,185,370	9,149,646	21,409,195	20,793,320	79,762,809	15,185,617	166,737,593
1902	10,042,536	25,300,972	12,836,909	21,945,909	22,344,222	86,471,577	22,036,565	185,725,657

TAX LEVY. 1901.

COUNTIES	STATE							COUNTY											
	State.....	Stock Detective and Inspector	Stock Indemnity.....	Sheep Inspector and Indemnity Tax.....	State Bounty... . . .	Fish and Game.....	Total	General Fund.	Contingent Fund.....	School Fund	High School Fund....	Bond and Interest Fund	Road Fund	Poor Fund.....	Bridge Fund.....	Sinking Fund.....	Total Number Mills Levied.....	Total	Total State and County.....
Beaverhead	2½	1½	1-16	½	3	1-10	7 53-80	5½	.....	2	2	.....	2	1	1	½	14	.....	21 53-80
Broadwater	2½	1½	1-10	½	3	1-10	7 7-10	3	5	2	.....	.....	2	½	1	.....	13½	.....	21 1-5
Carbon	2½	1½	1-10	½	3	1-10	7 7-10	7	3	2	.....	1½	2	.....	1	.....	16 ½	.....	24 1-5
Cascade	2½	1½	1-10	½	3	1-10	7 7-10	5½	.....	2	.....	.....	2	.....	.....	.....	9½	.....	17 1-5
Choteau	2½	1½	1-8	½	3	1-10	7 29-40	7¼	2½	2	.....	2½	1	1¼	1	.....	17½	.....	25 9-4
Custer	2½	1½	1-10	½	3	1-10	7 7-10	7	.....	2	.....	3½	2	1-10	1	.....	15 85-100	.....	13 5-100
Dawson	2½	1½	1-10	½	3	.....	7 6-10	6	4	2	.....	.....	½	½	4	2	19	.....	26 3-5
Deer Lodge	2½	1½	1-10	½	3	1-10	7 7-10	6	.....	2	.....	1½	1	1½	½	.....	12½	.....	20 1-5
Fergus	2½	½	1½	1-10	3	1-10	7 7-10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Flathead	2½	1½	1-10	½	3	1-10	7 7-10	8	.....	2	1 8-10	1	2	2-10	1	.....	16	.....	23 7-10
Gallatin	2½	1½	¼	½	3	1-10	7 17-20	½	.....	2	1	.....	2	.....	1	2	9	.....	16 17-20
Granite	2½	1½	1-10	½	3	1-10	7 7-10	11	4	2	.....	.....	2	2	1	.....	22	.....	29 7-10
Jefferson	2½	1½	1-10	½	3	1-10	7 7-10	4	3½	2	1	.....	2	.....	.....	2	14½	.....	22 1-10
Lewis and Clarke	2½	1½	½	½	3	1-10	8 1-10	4	.....	2	.....	.....	2	1	1	.....	10	.....	18 1-10
Madison	2½	1½	1-10	½	3	1-10	7 7-10	2	.....	2	.....	.....	2	1	.....	1	10	.....	17 7-10
Meagher	2½	1½	1-10	½	3	1-10	7 7-10	5	.....	2	.....	.....	1	.....	.....	7	15	.....	22 7-10
Missoula	2½	1½	1-10	½	3	1-10	7 7-10	3	4	2	.....	.....	2	½	.....	1	12½	.....	20 1-5
Park	2½	1½	1-10	½	3	1-10	7 7-10	2	4	2	1½	.....	2	1½	1	1	18¼	.....	25 19-20
Powell	2½	1½	1-10	1-10	3	1-10	7 3-10	8½	.....	2	.....	.....	2	2	½	.....	16	.....	23 3-10
Ravalli	2½	1½	1-10	½	3	1-10	7 7-10	8	2½	2	.....	1½	2	½	1	.....	17½	.....	25 1-5
Rosebud	2½	1½	1-10	½	3	1-10	7 7-10	11½	.....	2	.....	.....	.....	.....	.....	.....	13½	.....	21 1-5
Silver Bow	2½	1½	½	½	3	1-10	8 1-10	2½	.....	2	.....	.....	1	1	.....	½	7	.....	15 1-10
Sweet Grass	2½	1½	1-10	½	3	1-10	7 7-10	4½	.....	2	½	2½	2	.....	.....	.....	14½	.....	22 1-5
Teton	2½	1½	1-10	½	3	1-10	7 7-10	10	3	2	1¼	1¼	2	½	.....	.....	17	.....	24 7-10
Valley	2½	1½	1-10	½	3	1-10	7 7-10	6	3½	2	.....	.....	1	1	1½	2	17	.....	24 7-10
Yellowstone	2½	1½	1-10	½	3	1-10	7 7-10	4	2½	2	.....	1	2	½	1	1	14	.....	21 7-10

OFFICIAL ELECTION RETURNS OF THE STATE OF MONTANA, FOR
THE ELECTION HELD NOVEMBER 4, 1902.

BEAVERHEAD COUNTY.

PRECINCTS	Congress				Asso. Justice			Representative			Sheriff		Clerk & Rec'd'r		Treasur'r		Co. Atty		Assess'r		Survey'r		Coroner		Supt. Schools		Public Administr			
	Dee, L.....	3.....	7.....	22.....	12.....	14.....	18.....	16.....	14.....	13.....	17.....	5.....	25.....	19.....	10.....	17.....	13.....	16.....	13.....	18.....	12.....	14.....	16.....	20.....	9.....	9.....	20.....	52.....	822.....	
	Sproule, S.....	9.....	10.....	55.....	43.....	43.....	49.....	49.....	49.....	39.....	57.....	38.....	59.....	42.....	53.....	44.....	54.....	50.....	47.....	41.....	57.....	43.....	54.....	45.....	19.....	19.....	45.....	15.....	799.....	
	Dixon, R.....	11.....	10.....	23.....	21.....	16.....	15.....	20.....	17.....	19.....	17.....	15.....	21.....	12.....	24.....	20.....	17.....	18.....	18.....	14.....	20.....	17.....	20.....	15.....	11.....	10.....	10.....	11.....	398.....	
	Evans, D.....	16.....	34.....	40.....	8.....	6.....	10.....	12.....	10.....	11.....	10.....	9.....	13.....	12.....	12.....	14.....	8.....	12.....	9.....	8.....	11.....	10.....	10.....	11.....	10.....	10.....	10.....	10.....	398.....	260.....
Argenta	12.....	14.....	3.....	7.....	47.....	57.....	24.....	52.....	38.....	71.....	58.....	70.....	50.....	68.....	48.....	58.....	59.....	62.....	56.....	57.....	61.....	44.....	75.....	62.....	30.....	20.....	22.....	22.....	322.....	
Bannack	37.....	54.....	9.....	35.....	27.....	19.....	12.....	30.....	14.....	27.....	16.....	26.....	17.....	26.....	16.....	28.....	15.....	25.....	17.....	19.....	23.....	16.....	27.....	27.....	40.....	36.....	33.....	32.....	16.....	
Birch Creek	11.....	23.....	.....	10.....	25.....	25.....	29.....	30.....	21.....	37.....	32.....	27.....	22.....	35.....	20.....	39.....	29.....	29.....	28.....	18.....	38.....	24.....	34.....	26.....	20.....	11.....	20.....	11.....	20.....
Barrett	11.....	10.....	.....	9.....	17.....	17.....	15.....	17.....	15.....	23.....	8.....	20.....	12.....	19.....	13.....	24.....	9.....	19.....	11.....	12.....	19.....	17.....	15.....	30.....	20.....	22.....	22.....	32.....	32.....
Blacktail	16.....	34.....	.....	19.....	25.....	25.....	29.....	30.....	21.....	37.....	32.....	27.....	22.....	35.....	20.....	39.....	29.....	29.....	28.....	18.....	38.....	24.....	34.....	26.....	20.....	11.....	20.....	11.....	20.....
Bishop	19.....	13.....	.....	17.....	18.....	15.....	12.....	11.....	17.....	15.....	23.....	8.....	20.....	12.....	19.....	13.....	24.....	9.....	19.....	11.....	12.....	19.....	17.....	15.....	30.....	20.....	22.....	22.....	32.....
Bighole, 15.....	18.....	25.....	.....	19.....	24.....	18.....	22.....	19.....	24.....	22.....	21.....	22.....	19.....	28.....	21.....	25.....	21.....	23.....	21.....	23.....	15.....	27.....	15.....	30.....	20.....	22.....	22.....	32.....	32.....
Bighole, 16.....	47.....	57.....	9.....	41.....	27.....	19.....	12.....	30.....	14.....	27.....	16.....	26.....	17.....	26.....	16.....	28.....	15.....	25.....	17.....	19.....	23.....	16.....	27.....	27.....	40.....	36.....	33.....	32.....	16.....	
Dillon	238.....	348.....	5.....	230.....	252.....	262.....	297.....	339.....	258.....	349.....	276.....	313.....	208.....	390.....	248.....	346.....	295.....	306.....	293.....	292.....	218.....	371.....	202.....	398.....	260.....	322.....	322.....	322.....	322.....	
Dewey	24.....	18.....	.....	21.....	27.....	19.....	17.....	12.....	30.....	14.....	27.....	16.....	26.....	17.....	26.....	16.....	28.....	15.....	25.....	17.....	19.....	23.....	16.....	27.....	27.....	40.....	36.....	33.....	32.....
Dell	30.....	40.....	1.....	29.....	30.....	25.....	39.....	39.....	31.....	37.....	20.....	49.....	28.....	40.....	31.....	37.....	35.....	33.....	31.....	38.....	31.....	38.....	27.....	40.....	36.....	33.....	32.....	16.....		
Glendale	29.....	9.....	.....	24.....	27.....	19.....	9.....	8.....	27.....	13.....	27.....	9.....	23.....	16.....	25.....	12.....	25.....	13.....	28.....	10.....	26.....	11.....	29.....	29.....	23.....	23.....	25.....	23.....	23.....
Hecle	25.....	22.....	.....	22.....	29.....	26.....	24.....	34.....	36.....	33.....	36.....	30.....	27.....	38.....	33.....	32.....	32.....	18.....	23.....	27.....	17.....	32.....	17.....	32.....	25.....	23.....	23.....	25.....	23.....
Horseprairie	29.....	33.....	.....	29.....	26.....	24.....	21.....	17.....	25.....	25.....	28.....	22.....	28.....	22.....	25.....	32.....	32.....	18.....	23.....	27.....	17.....	32.....	17.....	32.....	25.....	23.....	23.....	25.....	23.....
Jackson	78.....	61.....	2.....	73.....	66.....	66.....	64.....	63.....	106.....	35.....	83.....	58.....	68.....	72.....	72.....	69.....	87.....	55.....	82.....	55.....	72.....	65.....	54.....	88.....	79.....	58.....	30.....	34.....	34.....	
Lima	59.....	67.....	2.....	57.....	71.....	2.....	69.....	54.....	57.....	47.....	65.....	64.....	45.....	83.....	55.....	71.....	82.....	49.....	55.....	73.....	56.....	71.....	54.....	76.....	54.....	73.....	73.....	73.....	73.....	
Pioneer	2.....	8.....	.....	2.....	0.....	0.....	10.....	9.....	1.....	9.....	2.....	8.....	1.....	9.....	1.....	9.....	2.....	8.....	3.....	7.....	1.....	9.....	1.....	9.....	2.....	8.....	8.....	8.....	8.....
Polaris	12.....	23.....	.....	10.....	10.....	8.....	20.....	25.....	12.....	24.....	14.....	24.....	12.....	27.....	12.....	24.....	16.....	18.....	16.....	20.....	11.....	25.....	6.....	33.....	13.....	23.....	13.....	23.....	23.....
Redrock	26.....	15.....	1.....	25.....	28.....	26.....	14.....	14.....	29.....	15.....	26.....	18.....	27.....	16.....	26.....	17.....	27.....	16.....	27.....	15.....	24.....	17.....	27.....	16.....	25.....	17.....	25.....	17.....	25.....	
Totals	723.....	874.....	33.....	679.....	771.....	704.....	804.....	824.....	846.....	832.....	708.....	871.....	679.....	982.....	760.....	888.....	877.....	790.....	846.....	789.....	688.....	943.....	652.....	1,012.....	799.....	822.....	822.....	822.....	822.....	822.....

For the Amendment Relating to Co. Commissioners, 452.
Against the Amendment Relating to Co. Commissioners, 406.

BROADWATER COUNTY - ELECTION RETURNS.

PRECINCTS	Congress			Asso. Justice		State Senator		Representative		Sheriff	Treas.	Clerk and Recorder								
	Evans, D	Dixon, R	Dee, L	Sproule, S	Leslie, D	Holloway, R	Cameron, S	Whipple, D	Albrecht, R	Pool, Cit. D	Shovlin, D	Ulm, D	Johnson, R	Williams, R	Deadmond, D	Munden, R	Durnen, D	Cronk, R	Schrelnner, D	Simpson, R
Diamond	24	17	2		19	28		19	16	10	24	21	25	19	24	24	25	21	33	13
Glenwood	4	9	1		2	10		2	9	2	..	1	11	11	9	3	1	12	8	6
East Pacific	11	2			8	6		4	2	7	11	6	8	..	10	4	9	5	14	..
Jefferson River	5	4			6	4		6	3	..	1	6	6	6	6	4	6	4	6	4
Lombard	3	4			3	4		6	2	..	3	2	5	5	6	3	3	5	4	3
Blackwell's	4	6			3	7		5	1	4	4	5	3	6	6	4	5	5	5	4
Hassel	17	23	3	4	12	31	4	16	21	9	19	16	29	21	33	15	39	36	19	24
Canton	43	14	2		40	21		40	8	16	36	29	30	25	26	38	43	23	37	26
Toston	27	40	1	3	22	44	3	25	37	13	13	38	44	54	51	28	25	52	48	31
Radersburg	45	53	13		37	78		45	51	37	42	46	69	68	70	50	39	71	62	55
Winston	48	57	17	5	26	122		38	48	61	52	41	126	67	49	106	86	73	94	49
Townsend	138	114	3	1	97	179	1	102	74	106	113	94	156	135	129	158	73	211	145	139
Totals	369	343	42	13	275	534	8	298	272	165	318	305	512	417	419	437	324	518	475	357

BROADWATER COUNTY—Continued.

PRECINCTS	Assessor	Co. Att'y		Supt. Schools		Coroner		Pub. Adm'r	Sur-vey'r	County Commissioners							For the Amendment....	Against the Amendment										
		Matthews, D.....	Goodman, Cit. D..	Record, D.	Walker, R	Harrington, Cit. D.	Hazleton.....			Walker, R.....	Malone, D.....	Lytle, D.....	Davis, R.....	Titman, R.....	McMillan, D.. ...	Murphy, D.			Glenn, D.....	Kimpton, R.....	McDonald, R....	Thompson, R.....	Rader, Cit. D.....					
Diamond	33	12	16	23	16	21	8	22	.....	.....	26	.....	.....	25	27	37	15	17	14	.....	.....	.....	.....	.....	.....	.....	.....	.....
Glenwood	11	3	6	6	2	8	4	3	.....	.....	3	.....	.....	4	3	.....	10	8	13	1	.....	.....	.....	.....	.....	.....	.....	.....
East Pacific	11	3	9	4	.....	2	10	4	.....	.....	10	.....	.....	12	6	.....	.....	11	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jefferson River	6	4	3	4	4	3	3	3	.....	.....	6	.....	.....	6	6	3	5	2	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lombard	2	4	3	2	3	4	.....	4	.....	.....	4	.....	.....	2	3	2	5	4	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Blackwell's	6	4	9	.....	.....	6	2	4	.....	.....	4	.....	.....	5	6	4	4	4	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hassel	20	25	22	15	9	17	20	21	.....	.....	15	.....	.....	19	19	3	25	19	35	7	.....	.....	.....	.....	.....	.....	.....	.....
Canton	47	15	39	17	7	42	14	17	.....	.....	33	.....	.....	45	47	34	19	11	24	.....	.....	.....	.....	.....	.....	.....	.....	.....
Toston	38	41	35	16	11	48	20	36	.....	.....	27	.....	.....	29	40	15	48	34	44	4	.....	.....	.....	.....	.....	.....	.....	.....
Radersburg	40	75	66	26	34	41	40	53	.....	.....	47	.....	.....	49	47	23	54	44	64	30	.....	.....	.....	.....	.....	.....	.....	.....
Winston	91	52	79	41	19	51	87	47	1	1	81	.....	.....	93	47	22	26	111	48	3	.....	.....	.....	.....	.....	.....	.....	.....
Townsend	200	75	102	143	90	100	81	129	.....	.....	103	.....	.....	152	97	39	150	133	182	17	.....	.....	.....	.....	.....	.....	.....	.....
Totals	505	313	389	297	195	343	289	343	1	1	359	1	1	441	348	186	361	398	438	62	.....	.....	.....	.....	.....	.....	.....	83

CARBON COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress			Associate Justice		Representative		Sheriff		Treasurer						
	Dixon, R.	Evans, D.	Sproule, S.	Dee, L.	Hoffman, R.	Leslie, D.	Cameron, S.	Tolman, R.	Crismas, D.	Fairgreieve, L.	Potter, R.	Dunn, D.	Bergen, L.	Wright, R.	Davis, D.	Renland, I.
Rockvale	40	33	.....	4	43	33	.....	21	53	5	36	43	3	35	41	1
Joliet	42	31	.....	2	49	32	.....	27	41	11	43	46	1	41	35	2
Bridge	73	62	3	26	94	71	.....	69	67	38	108	45	37	74	67	37
Reno	29	10	.....	1	28	10	1	34	7	.....	24	17	.....	28	14	.....
Roberts	51	30	2	16	69	31	2	42	26	36	49	51	6	50	44	10
Red Lodge—East	114	78	18	81	216	73	10	88	77	157	145	133	52	111	132	67
Red Lodge—West	102	65	4	35	146	62	2	7	69	72	91	111	21	96	105	22
Jackson	24	16	.....	2	26	16	.....	12	16	5	24	19	2	24	21	.....
Fishtail	16	15	1	1	18	15	1	19	13	5	24	13	.....	21	13	2
Morris	34	11	.....	7	42	11	.....	29	13	12	39	9	5	37	10	6
Absarokee	37	32	.....	2	42	29	.....	3	34	2	55	18	1	45	28	.....
Bowler	12	10	.....	.....	13	9	.....	14	8	1	19	2	2	15	8	.....
Carbonado	34	16	.....	6	43	14	.....	13	11	25	32	26	5	28	28	3
Gebo	61	31	1	1	67	27	1	44	44	9	42	54	4	51	46	1
Selesia	13	19	.....	5	19	18	.....	13	22	6	15	26	1	19	16	4
Yellowstone	20	5	.....	.....	18	6	.....	20	5	.....	19	5	.....	20	5	.....
West Rosebud	27	21	.....	2	29	20	1	24	23	3	27	23	1	31	18	2
Linley	27	11	.....	5	32	10	.....	22	15	8	26	15	5	27	15	5
Totals	756	496	29	196	994	487	18	623	544	395	818	656	146	753	646	162

CARBON COUNTY—Continued.

PRECINCTS	Clerk and Recorder			Assessor			Attorney			Supt. of Schools			Surveyor			Coroner			Public Adm'r			Against the Amendment.....
	Smith, R....	Finley, D.....	Jones, L.....	Crockett, R.....	Dusinberre, D....	McIntosh, L.....	Woodward, R....	Reno, D.....	Ruberson, L.....	Dilworth, R.....	Ross, D.....	Cochrane, L.....	Hine, R.....	Dickey, L-D.....	Underwood, R....	Butler, D-L.....	Smethurst, R....	Baldwin, D.....	Rydberg, L.....	For the Amend-ment.....		
Rockvale	23	56	2	32	42	4	35	37	9	31	43	6	26	55	32	46	37	37	2	.....	.....
Joliet	42	51	.....	39	43	5	45	36	4	37	47	1	38	38	41	44	38	30	4	.....	.....
Bridger	64	83	24	81	51	39	72	71	33	57	72	46	115	60	69	90	75	59	27	.....	.....
Reno	19	20	1	28	9	3	8	30	4	23	12	5	27	12	25	15	30	11	.....	.....	.....
Roberts	43	43	17	51	35	18	39	39	25	36	56	13	52	48	47	51	45	43	11	.....	.....
Red Lodge—East	125	94	92	100	82	123	92	109	107	95	136	77	111	171	97	194	95	102	91	.....	.....
Red Lodge—West	90	84	45	88	68	63	74	97	49	85	100	42	100	110	96	116	86	86	36	.....	.....
Jackson	22	21	.....	14	11	20	14	21	9	18	22	4	23	20	25	16	25	16	1	.....	.....
Fishtail	14	20	2	10	25	1	19	14	3	12	23	1	17	18	18	17	19	13	3	.....	.....
Morris	27	20	6	20	28	6	30	15	8	17	31	6	40	12	31	22	33	11	6	.....	.....
Absarokee	38	32	1	14	61	.....	40	32	1	29	43	.....	38	35	42	28	40	32	.....	.....	.....
Bowler	13	10	.....	9	13	.....	13	9	.....	4	17	.....	15	8	8	14	10	12	.....	.....	.....
Carbonado	25	34	2	28	20	10	34	19	6	23	30	6	35	25	30	27	32	17	.....	.....	.....
Gebo	47	50	1	54	41	1	43	45	9	43	51	2	62	35	39	57	54	34	2	.....	.....
Silesia	11	27	4	20	15	4	19	16	5	12	23	6	19	22	11	25	12	21	4	.....	.....
Yellowstone	16	9	.....	8	17	.....	20	5	.....	20	4	.....	19	6	18	6	19	6	.....	.....	.....
West Rosebud	25	22	2	16	33	2	24	25	1	14	34	3	29	22	25	26	26	23	2	.....	.....
Linley	20	19	6	21	8	15	19	20	5	14	24	8	25	18	25	18	27	10	5	.....	.....
Totals	664	695	205	623	603	314	640	640	278	570	767	223	803	715	679	812	703	563	198	422	14	

CASCADE COUNTY—Continued.

PRECINCTS	Congress				Associate Justice		State Senator				
	Evans, D	Dixon, R	Dee, L	Sproule, S	Leslie, D	Holloway, R	Cameron, S	Ewing, D	Maddox, R	Richardson, F	Hirt, S
Mission	11	27	1		12	26		8	28		
Milligan	10	11			12	8		8	12		
Monarch	10	9			12	7		9	9		
Nason	10	14			15	9		11	14		
Nelhart	79	53	49		75	115		68	46	71	5
Orr	9	11			14	8		9	12		
Robertson	1	3			3	1		1	3		
Riceville	10	5	2		14	5		9	3	8	
Red Butte	19	16	5		25	18		15	20	8	1
Sand Coulee	16	46	32		23	77		16	41	44	12
Sunnyside	6	8			10	4		6	7	1	
Sun River	22	25			26	20		19	27	1	
Stockett	55	48	18		51	71		52	45	22	31
Truly	7	14	2		10	13		3	15	7	4
Ulm	5	4			6	5		5	4		
Willow Creek	15	11			17	12		17	10	1	1
Totals	1,563	1,896	315	3,131	2,361	1,620	2,466	1,533	1,670	661	152

CASCADE COUNTY—Continued.

Members of the Legislature	
Purcell, S.....	153
Hull, S.....	160
Rudein, S.....	158
Olson, S.....	175
Carpenter, S.....	162
Earle, F.....	403
Longstaff, F.....	398
Dennis, F....	340
McKee, F.....	360
Moore, F.....	421
Pearson, L., R...	1,726
Wilson, R.....	1,783
Buchanan, R....	1,794
Harrison, R.....	1,889
Nelson, R.....	1,671
McNally, D.....	1,255
Pearson, J., D...	1,383
Skinner, D.....	1,574
Birkenbuel, D...	1,567
Wood, D.....	1,715
Totals	15,671

CASCADE COUNTY—Continued.

PRECINCTS	Clerk and Recorder				Sheriff			Treasurer				Assessor			
	Largent, D.....	Hill, R.....	Wick, F.....	McDermand, S.....	Benner, D.....	Moran, R.....	Dolson, S.....	Wadsworth, D....	Roberts, R.....	McDermott, S....	Bundy, D.....	McGiffin, R.....	McElliot, F.....	Kessner, S.....	
Great Falls 1st	168	232	4	11	237	180	6	208	210	10	189	206	13	8	
Great Falls 2nd	164	148	15	17	233	133	9	169	179	13	202	120	22	10	
Great Falls 3rd	209	283	24	13	285	255	10	228	290	13	219	262	35	16	
Great Falls 4th W.....	64	98	8	10	103	82	7	84	96	9	73	88	17	10	
Great Falls 4th E.....	87	197	15	9	156	154	7	95	200	12	116	166	14	11	
West Great Falls	79	62	5	8	91	77	6	62	99	7	72	64	19	6	
Adel.....	7	3	1	.....	9	4	1	9	2	1	7	5	.....	1	
Armington	10	42	2	.....	27	29	.....	25	30	.....	23	33	1	.....
Albright	6	12	1	.....	13	8	.....	9	11	.....	13	6	1	.....
Belt (East)	52	95	10	.....	79	76	.....	77	70	2	74	74	8	1	
Belt (West)	60	115	8	5	103	86	6	92	81	9	86	87	7	7	
Belt Park	9	11	.....	.....	12	10	.....	12	10	.....	14	8	.....	.....
B. & M. Smelter	24	76	.....	.....	26	78	.....	39	62	.....	32	68	.....	.....
Box Elder	5	18	1	.....	16	13	1	9	17	2	15	13	1	1	
Black Butte	22	19	.....	3	27	15	.....	16	26	1	25	15	1	.....
Boston Heights	26	42	3	2	30	42	2	27	42	4	27	42	3	2	
Barker	16	12	.....	4	15	12	5	18	14	3	27	5	.....	3	
Cascade	49	87	2	.....	81	67	.....	58	83	1	63	82	1	.....
Cora	9	18	.....	.....	14	14	.....	11	13	.....	11	17	.....	.....
Davis Creek	6	15	1	.....	13	9	.....	12	9	.....	14	8	.....	.....
Dry Wolf	6	4	.....	.....	4	6	.....	6	4	.....	7	3	.....	.....
Evans	11	29	1	2	23	19	2	10	30	2	22	20	1	1	
Field	11	16	1	.....	15	15	.....	13	15	.....	15	13	1	.....
Gibson .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Geyser	12	9	.....	.....	14	10	.....	11	10	.....	11	11	.....	.....
Hardy	7	6	.....	.....	8	5	.....	7	6	.....	7	6	.....	.....
Kibby	25	30	.....	.....	33	25	.....	27	27	.....	48	9	.....	1	
Little Chicago	31	130	14	4	56	127	2	43	134	2	27	131	11	3	

CASCADE COUNTY—Continued.

PRECINCTS	Clerk and Recorder			Sheriff		Treasurer		Assessor						
	Largent, D.	Hill, R.	Wick, F.	McDermant, S....	Benner, D.	Moran, R.	Dolson, S.	Wadsworth, D....	Roberts, R.	McDermott, S....	Bundy, D.	McGiffin, R.	McElliot, F.	Kessner, S.
Mission	11	26	.....	.....	8	32	.....	11	27	.....	9	29	.....	.....
Milligan	8	11	.....	.....	16	4	.....	11	9	.....	7	13	.....	.....
Monarch	7	14	.....	.....	14	7	.....	9	9	.....	12	8	.....	.....
Nason	10	15	.....	.....	12	13	.....	5	20	.....	16	9	.....	.....
Neihart	91	66	20	6	87	104	5	126	47	9	118	48	15	6
Orr.....	7	13	1	.....	12	10	.....	9	12	.....	8	13	.....	.....
Robertson	1	3	.....	.....	4	.....	.....	2	2	.....	.....	4	.....	.....
Riceville	5	13	1	.....	11	9	.....	10	8	.....	13	4	1	1
Red Butte	17	25	3	.....	28	18	.....	19	23	.....	26	16	2	1
Sand Coulee	15	35	56	6	19	79	15	23	61	14	14	63	19	16
Sunnyside	9	5	.....	.....	8	6	.....	6	8	.....	9	5	.....	.....
Sun River	31	15	.....	.....	16	30	.....	20	26	.....	30	16	.....	.....
Stockett	50	51	19	25	72	57	24	67	52	23	55	58	7	33
Truly	14	10	1	3	15	9	3	8	14	.....	4	18	1	3
Ulm	7	2	.....	.....	5	5	.....	4	6	3	7	3	.....	.....
Willow Creek	16	14	.....	1	16	14	1	17	12	1	19	11	.....	1
Totals	1,474	2,127	217	130	2,063	1,948	112	724	2,106	142	1,786	1,880	199	142

CASCADE COUNTY—Continued.

PRECINCTS	County Att'y		Auditor		Surveyor		Supt. Schools		Coroner		Public Administrator			For the Amendment.		Against the Amendment	
	Stanton, D.....	Berry, R.....	Nalbach, D.....	Jones, R.....	Fisher, S.....	Spafford, D.....	Whitten, R.....	Kearns, D.....	Hathaway, R.....	Brady, D.....	Gordon, R....	Sweeney, F.....	Madden, D.....	Powers, R.....	Tanner, S.....		
Great Falls 1st	214	243	266	141	7	244	167	264	150	188	189	40	224	160	9	.....	.....
Great Falls 2nd	210	139	902	128	12	191	134	231	116	212	117	38	185	117	14	.....	.....
Great Falls 3rd	228	300	246	233	12	245	258	295	229	234	231	66	268	220	19	.....	.....
Great Falls 4th W.	75	100	111	64	9	98	79	116	67	75	88	18	74	85	10	.....	.....
Great Falls 4th E.	117	188	126	165	12	113	179	138	164	97	181	25	100	173	17	.....	.....
West Great Falls	79	80	76	71	8	77	70	96	64	91	63	13	71	70	9	.....	.....
Adel	7	6	10	3	.....	10	3	10	2	8	5	.....	8	5	.....	.....	.....
Armington	29	26	21	35	.....	26	29	25	29	28	27	1	30	26	.....	.....	.....
Albright	14	6	5	14	.....	5	14	11	9	6	14	.....	12	8	.....	.....	.....
Belt (East)	74	76	62	93	.....	76	74	89	67	72	73	5	75	69	1	.....	.....
Belt (West)	82	97	69	109	6	92	87	110	77	86	85	11	89	83	5	.....	.....
Belt Park	11	11	6	15	.....	9	13	12	10	8	13	.....	9	12	.....	.....	.....
B. & Smelter	23	78	44	54	.....	31	68	27	74	31	69	1	31	67	.....	.....	.....
Box Elder	11	18	6	22	2	11	16	13	14	8	18	.....	7	18	2	.....	.....
Black Butte	20	21	26	15	5	24	18	31	11	17	24	.....	22	19	1	.....	.....
Boston Heights	29	42	35	31	.....	28	42	36	38	26	39	7	32	34	2	.....	.....
Parker	16	11	5	27	1	13	10	18	9	27	3	.....	13	10	3	.....	.....
Cascade	59	86	59	83	.....	70	73	78	67	56	79	5	60	71	1	.....	.....
Cora	15	12	3	23	.....	8	16	11	16	9	15	.....	8	16	.....	.....	.....
Davis Creek	11	9	.....	21	.....	7	14	12	9	7	13	.....	11	9	.....	.....	.....
Iry Wolf	6	4	1	9	.....	6	4	6	4	7	3	.....	5	5	.....	.....	.....
Evans	13	28	15	27	1	12	29	22	18	14	24	2	17	24	2	.....	.....
Field	14	16	14	16	.....	15	15	22	7	11	12	.....	16	11	.....	.....	.....
Gibson .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Geyser	12	8	4	19	.....	11	8	14	6	10	10	1	9	9	.....	.....	.....
Hardy	7	6	7	5	.....	7	6	8	5	7	5	.....	7	5	.....	.....	.....
Klady	29	30	4	54	.....	27	30	34	24	25	31	1	27	28	.....	.....	.....
Little Chicago	36	136	32	137	3	34	138	47	125	35	134	6	26	135	3	.....	.....

CASCADE COUNTY—Continued.

PRECINCTS	County Att'y		Auditor		Surveyor		Supt. Schools		Coroner		Public Administrator			For the Amendment.....		Against the Amendment	
	Stanton, D.....	Berry, R.....	Nalbach, D.....	Jones, R.....	Fisher, S.....	Spafford, D.....	Whitten, R.....	Kearns, D.....	Hathaway, R.....	Brady, D....	Gordon, R.....	Sweeney, F.....	Madden, D.....	Powers, R.....	Tanner, S.....		
Mission	11	27	10	28	...	14	24	13	25	11	26	...	1	10	26	...	...
Millegan	8	11	10	10	...	10	10	15	5	8	11	...	1	8	11	...	...
Monarch	13	8	6	15	...	11	10	9	11	15	5	...	...	14	7	...	...
Nason	12	13	4	20	...	9	13	12	11	8	15	...	...	12	11	...	...
Nelhart	126	54	83	89	9	108	63	131	47	110	59	13	...	112	49	15	...
Orr	7	14	9	11	...	9	11	14	6	9	13	...	...	10	11	...	...
Robertson	3	1	1	3	...	1	3	3	1	...	...	4	...	4	...	...	...
Riceville	14	4	6	13	1	11	7	12	8	11	7	...	...	12	7	1	...
Red Butte	18	21	24	15	1	24	17	26	16	24	15	5	...	22	15	...	...
Sand Coulee	27	64	24	59	21	25	63	35	57	24	52	19	...	19	49	24	...
Sunnyside	6	8	7	7	...	6	8	9	5	6	8	...	...	6	...	...	...
Sun River	23	21	21	22	...	17	27	24	21	16	28	...	...	18	26	...	...
Stockett	62	62	57	60	23	59	68	84	48	59	56	7	...	58	47	27	...
Truly	9	16	6	17	3	9	16	12	15	3	19	2	...	6	15	3	...
Ulm	5	5	6	4	...	6	4	4	6	6	4	1	...	5	5	...	...
Willow Creek	16	13	9	20	1	15	14	19	11	13	16	...	...	17	11	1	...
Totals	1,801	2,079	1,773	2,007	137	1,844	1,952	2,198	1,704	1,723	1,899	295	1,765	1,794	109	1,62	754

CHOTEAU COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress				Associate Justice			Senator		Representatives				Judge Dist. Court
	Dixon, R	Evans, D	Sproule, S	Dee, L	Holloway, R	Leslie, D	Cameron, S	Bourne, R	O'Neal, D	Rice, R	Everett, R	Crutcher, D	Fox, D	Tatten, D
Harlem, 1	66	14	1	1	69	14	.....	62	27	59	75	6	32	38
London, 2	7	8	1	1	10	7	.....	4	13	8	16	2	4	14
Landusky, 3	27	11	1	.....	27	14	1	28	12	23	32	9	13	26
Chinook, 4	143	76	1	.....	137	90	1	101	130	142	139	75	73	103
Lower Clear Creek, 5	9	4	.....	.....	8	4	.....	8	5	8	8	4	4	9
Lloyd, 6	30	15	.....	.....	32	15	.....	32	17	23	30	11	13	22
Cleveland, 7	22	4	.....	.....	20	4	.....	17	11	20	18	4	4	10
Warriek, 8	13	11	.....	.....	16	9	.....	11	15	16	11	10	8	12
Egan, 9	10	1	.....	.....	8	2	.....	6	5	8	6	3	2	11
Havre, 10	162	140	4	2	163	155	4	177	172	156	159	134	120	280
Big Sandy, 11	34	20	.....	1	34	22	.....	33	26	31	34	25	18	33
Box Elder, 12	17	9	.....	.....	17	9	.....	14	11	16	13	10	5	14
Chester, 13	14	6	.....	.....	13	8	.....	9	12	13	13	7	5	9
Gold Butte, 14	20	31	.....	.....	34	29	.....	20	45	29	27	32	26	40
East Butte, 15	19	6	.....	.....	17	6	.....	24	3	18	17	6	5	8
Lucille, 16	6	3	.....	.....	6	3	.....	8	1	6	4	4	3	5
Valleaux, 17	6	2	.....	.....	6	2	.....	6	2	6	6	2	1	8
Perrysburgh, 18	7	3	.....	.....	6	4	.....	7	4	6	6	3	5	6
Fort Benton, 19	114	53	1	5	125	65	.....	109	76	129	104	68	49	115
Marias, 20	11	4	.....	.....	13	2	.....	11	5	10	9	6	5	7
Upper Highwood, 21	20	22	.....	.....	17	30	.....	17	29	22	18	23	21	32
Shonkin, 22	3	15	.....	.....	5	13	.....	2	16	3	3	15	12	16
Flagler, 23	5	4	1	.....	3	5	1	2	7	5	4	4	4	8
Phillips, 24	14	.....	.....	.....	13	1	.....	14	.....	13	13	.....	1	3
Libby's, 25	9	1	.....	.....	4	6	.....	7	1	7	7	1	1	7
Upper Shonkin, 26	6	3	.....	.....	6	5	.....	5	6	5	5	6	4	7
Circle Ranch, 27	6	4	.....	.....	7	4	.....	7	5	6	6	6	4	7
Belmont, 28	9	1	.....	.....	.....	10	.....	7	3	3	2	10	5	10
Basin, 29	8	9	1	.....	16	3	1	4	15	7	7	9	7	12
Ragland, 30	4	1	.....	.....	4	1	.....	4	2	4	3	1	1	3
Simpson, 31	9	2	.....	.....	12	.....	.....	7	6	10	10	1	1	2
Lee, 32	4	1	.....	.....	2	4	.....	4	2	2	3	3	2	4
Totals	844	484	9	10	850	546	8	767	693	824	808	500	458	881

CHOTEAU COUNTY—Continued.

PRECINCTS	Sheriff	Treas	Clerk and Recorder	Assessor	Attorney	Supt. Sch's Adm'r	Cor-oncr	Sur-veyor		
									For the Amend-ment.....	Against the Amendment.....
Harlem, 1.....	39	48	68	75	9	69	20	74	11	76
Dodson, 2.....	5	13	8	10	7	7	11	7	12	12
Landusky, 3.....	25	16	27	35	5	18	25	10	9	6
Chinook, 4.....	74	162	123	136	87	141	98	155	59	154
Lower Clear Creek, 5.....	2	11	7	9	4	8	5	7	3	8
Lloyd, 6.....	18	31	28	31	17	28	22	33	11	33
Cleveland, 7.....	12	17	22	22	6	18	11	21	4	20
Warrick, 8.....	8	18	14	18	6	18	8	16	10	17
Egan, 9.....	4	8	8	9	2	10	2	9	2	10
Hayre, 10.....	229	136	197	191	123	123	217	206	117	226
Big Sandy, 11.....	17	42	29	40	19	38	21	40	18	39
Box Elder, 12.....	11	14	18	18	7	9	18	18	9	18
Chester, 13.....	13	6	15	14	6	12	9	13	8	14
Gold Butte, 14.....	32	35	33	38	24	25	38	40	22	40
East Butte, 15.....	17	8	20	18	6	15	9	16	6	18
Lucille, 16.....	4	3	7	8	1	6	3	6	3	8
Valleaux, 17.....	5	2	7	7	1	6	2	7	1	7
Perrysburgh, 18.....	6	4	10	9	2	7	4	9	2	8
Fort Benton, 19.....	115	80	157	145	41	122	65	154	32	123
Marias, 20.....	10	6	13	13	3	7	9	13	3	14
Upper Highwood, 21.....	14	34	19	32	15	29	19	32	16	25
Shonkin, 22.....	1	17	4	3	14	2	16	6	12	3
Flagler, 23.....	4	5	6	6	3	6	3	6	3	5
Phillips, 24.....	11	3	12	13	.....	13	1	14	.....	6
Libby's, 25.....	8	1	9	9	1	9	1	9	2	12
Upper Shonkin, 26.....	7	4	8	5	5	7	3	6	6	9
Circle Ranch, 27.....	5	7	8	9	3	6	5	8	8	8
Belmont, 28.....	.....	10	10	9	1	2	8	10	3	10
Basin, 29.....	7	12	12	15	1	6	15	13	6	12
Ragland, 30.....	3	2	4	5	.....	5	1	6	1	10
Simpson, 31.....	10	2	10	9	2	10	2	11	2	4
Lee, 22.....	1	4	5	6	1	6	1	3	1	10
Totals	717	761	918	966	422	787	672	1,004	394	145

CUSTER COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress				Associate Justice				Representative			Sheriff		Treasurer				
	Dixon, R.....	Evans, D.....	Sproule, S.....	Dee, P.....	Dee, L.....	Holloway, R.....	Leslie, D.....	Cameron, S.....	Holloway, P.....	Holloway, L.....	Burt, R.....	Sykes, R.....	Truscott, D.....	Myers, D.....	Savage, R.....	Tozer, D.....	Robbins, R.....	Gerhart, D.....
Miles City, 1.....	121	70		8		143	56	3			139	116	89	60	134	85	123	9
Miles City, 2.....	134	71		8		159	65	1			142	111	103	66	159	94	122	118
Government Sawmill.....	19	5				21	4				16	16	12	6	21	7	22	6
Sadie.....	7	1				10	2				9	8	4	2	8	4	8	4
Herman's Ranch.....	9	3				10	4				5	8	7	3	11	2	6	8
Kinzie.....	4	3				4	3				3	4	4	3	3	4	3	4
Theade's Ranch.....	5	1				5	1				4	5	3	0	4	2	5	1
Platchford.....	2	3				2	3				3	2	3	1	2	3	2	3
Terry.....	43	7				48	7				54	37	9	3	43	17	46	11
Fallon.....	4	3		1		6	3				3	6	7	1	3	7	5	4
Sandstone.....	6	3				6	3				6	6	3	2	6	3	7	2
Fenn's Ranch.....	6	1				6	1				6	5	2		6	1	6	1
Smith's Ranch.....																		
Bovee's Ranch.....																		
Ekalaka.....	64	43		2		67	45				62	84	48	22	67	51	70	44
Laney's Ranch.....	4	5		1		7	4				6	6	3	5	7	4	5	6
O'Neill's Ranch.....	7	1				6	1				1	7	7	0	7	1	8	0
T. D. Ranch.....	3	1		1		4	1				3	5	1	0	3	2	1	4
Knowlton.....	15	9				14	9				7	13	19	12	18	8	11	12
Brandenburg.....	3	6				4	5				6	2	3	4	3	6	3	6
Garland.....	10	5		1		10	6				11	9	7	6	12	5	6	12
Beebe's Ranch.....	3	5		2		5	4	1			2	2	8	2	9	1	8	2
Stacey P. O.....	13	13	2			14	14	1			13	12	18	13	16	14	17	14
Selway's Ranch.....																		
Powderville.....	11	7				11	7				5	12	12	5	15	3	12	6
S. H. Ranch.....	1	3				2	4				1	3	3	1	2	4	2	4
Capitol.....	8	1	3			9	1	4			10	9	3	2	12	2	10	4
Buck's Ranch.....	7	7				7	7				6	6	8	2	11	4	11	4
Ridge School House.....	3	2				3	2				3	2	2	2	3	2	4	1
Five Mile School House.....	15	4				15	4				15	14	4	5	16	3	16	3
Jasper Rue's Ranch.....	5	3				6	3				4	5	4	3	6	2	5	4
Bay Horse Ranch.....	10	6				10	6				8	9	8	7	14	4	13	4
Otter.....	9	6				11	5				11	10	6	3	10	7	11	5
Willow Creek Crossing.....	8	4				8	4				7	6	6	4	10	2	8	4
Totals.....	559	300	7	22	1	633	284	10			562	540	416	246	641	356	576	395

CUSTER COUNTY--Continued.

PRECINCTS	Clerk and Recorder		Assessor		Attorney		Supt. of Schools		Surveyor		Pub. Adm'r		Coroner	
	Darnall, R.....	McAusland, D....	Crosby, R.....	Hotchkiss, D.....	Johnston, R.....	Sanner, D.....	Wiley, R.....	Zook, D.....	Flynn, R.....	Scheetz, D.....	Hawkins, R.....	Forseth, D.....	Bateman, R.....	Millard, D.....
Miles City, 1.....	101	108	154	54	124	91	112	102	91	117	117	88	119	89
Miles City, 2.....	120	124	175	57	139	105	156	88	109	130	146	87	127	103
Government Sawmill	20	8	23	4	13	15	16	11	18	10	19	8	16	10
Sadie	8	4	11	1	9	3	7	5	8	4	11	1	8	4
Herman's Ranch	11	3	12	2	6	7	8	5	8	5	11	3	8	5
Kinzie	1	6	5	2	4	3	2	4	1	6	4	3	2	5
Theade's Ranch	1	5	5	1	4	2	6	0	3	3	5	1	5	1
Blatchford	1	4	2	3	2	3	3	2	2	3	2	3	1	4
Terry	48	10	50	9	41	16	34	24	37	22	49	7	50	6
Fallon	6	4	7	3	5	5	7	3	3	7	5	5	5	4
Sandstone	6	3	7	2	6	3	4	5	5	4	7	2	7	4
Fenn's Ranch	6	1	7	0	7	0	6	1	2	5	7	0	6	1
Smith's Ranch .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bovee's Ranch .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ekalaka	57	59	73	44	54	61	63	54	54	60	70	45	67	47
Laney's Ranch	4	7	11	0	2	9	1	10	3	8	10	1	9	2
O'Neill's Ranch	3	5	5	2	0	8	1	7	6	2	3	5	6	2
T. D. Ranch	2	3	4	1	2	3	3	2	2	2	3	2	4	1
Knowlton	12	13	18	7	13	13	11	14	10	15	18	7	15	9
Brandenburg	1	8	4	5	4	5	0	9	3	6	4	5	4	5
Garland	12	5	11	6	6	11	6	12	6	11	12	5	11	6
Beebee's Ranch	6	4	9	1	5	5	9	1	4	6	9	1	9	1
Stacey P. O.....	13	17	19	10	12	18	16	14	11	18	16	14	12	17
Selway's Ranch .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Powderville	8	10	12	6	11	7	8	9	9	9	11	7	12	6
S. H. Ranch	1	5	4	2	1	5	0	6	1	5	2	4	2	4
Capitol	11	3	12	2	8	6	9	5	6	7	12	1	11	2
Fuck's Ranch	7	7	11	4	4	10	5	9	4	10	6	8	6	8
Ridge School House	1	4	4	1	2	1	4	1	1	3	3	0	1	3
Five Mile School House	16	3	16	3	15	4	17	2	12	7	15	4	13	6
Jasper Rue's Ranch	7	3	8	1	7	2	7	3	1	9	5	2	5	3
Bay Horse Ranch	10	6	17	1	8	8	14	4	4	13	15	3	11	6
Otter	6	11	15	1	11	6	9	8	2	14	16	0	12	4
Willow Creek Crossing	4	8	11	1	6	6	2	10	2	9	8	4	8	4
Totals	510	461	722	236	531	441	546	430	428	530	619	326	572	370

For the Amendment 331 Against the Amendment 70

DAWSON COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress					Associate Justice		Representative		Sheriff	
	Dixon, R.....	Evans, D.....	Sproule, S.....	Dee, L.....	Holloway, R.....	Leslie, D.....	Cameron, S.....	McCone, R.	Burdick, D.....	Kennedy, R.....	Williams, D.....
Gilendive	180	76	7	8	196	79	7	183	107	129	171
Wilbax	42	32	1	4	45	33	1	46	38	23	66
Glenwood	7	.....	.....	.....	6	1	.....	6	1	2	5
Sidney	20	2	.....	.....	24	2	.....	24	3	17	10
Newlon	18	4	.....	.....	22	5	.....	22	2	9	17
Tokna	19	1	.....	1	19	1	.....	19	1	11	10
Hardscrabble.....	12	.....	.....	.....	14	.....	.....	14	.....	8	6
Missouri	6	6	.....	.....	6	6	.....	6	6	3	9
Burns Creek	28	6	.....	.....	28	6	.....	32	4	25	12
Bad Route	6	9	.....	.....	6	9	.....	6	9	2	13
McCune	10	8	.....	.....	10	7	.....	10	9	1	20
Ridgeland	23	5	.....	.....	26	6	.....	26	5	15	17
Pig Dry	8	1	.....	.....	8	3	.....	9	3	11	1
Red Water	12	4	.....	.....	13	4	.....	12	4	4	15
Circle	6	.....	1	.....	7	.....	1	7	1	7	1
Kismet	3	.....	.....	.....	4	3	.....	5	2	5	2
Hunter	3	5	.....	.....	3	5	.....	4	5	.....	10
Burgess	12	1	.....	.....	11	1	.....	11	1	8	5
Totals	415	160	9	13	445	171	9	442	201	280	390

DAWSON COUNTY—Continued.

PRECINCTS	Treasurer		Clerk and Recorder		County Att'y		Supt. Schls.	Assessor		Sur-veyor	Public Adm'r	Coroner		
	Davis, R.....	Johnson, D.....	Wyman, R.....	Goulding, D.....	Holmes, R.....	Hurley, D.....	Skinner, R.....	Johnson, R.....	Brown, D.....	Cummins, R.....	Sample, R.....	Butler, D.....	Foster, R.....	Donohue, D.....
Glendive	179	107	160	134	125	169	234	203	96	224	179	105	191	96
Wibaux	49	38	39	50	29	55	64	59	27	62	45	27	35	47
Glenwood	6	.....	5	2	8	.....	5	6	1	4	2	.....	4	.....
Sidney	23	3	20	6	21	6	23	17	9	21	19	5	23	.....
Newlon	17	6	17	8	10	13	21	15	11	19	14	8	13	10
Tokna	18	2	17	3	16	4	20	14	6	20	17	3	17	2
Hardscrable.....	14	.....	14	.....	13	1	14	11	3	14	14	.....	14	.....
Missouri	3	9	6	6	4	8	9	5	7	8	6	6	6	6
Burns Creek	29	8	26	10	24	11	3	30	7	30	27	8	27	9
Bad Route	5	9	6	9	2	13	9	7	8	6	4	11	7	8
McCune	7	12	10	11	5	14	11	7	12	14	10	8	9	8
Ridgelayn	25	6	24	7	19	12	28	16	16	28	25	6	23	8
Big Dry	9	3	11	1	6	6	10	8	3	11	8	3	7	4
Red Water	9	8	10	9	4	15	10	10	9	8	8	6	8	7
Circle	8	.....	7	1	6	2	8	8	.....	8	8	.....	8	.....
Kismet	5	2	5	2	5	2	6	3	4	6	5	2	5	2
Hunter	3	7	10	.....	2	6	7	5	5	6	4	5	5	5
Burgess	10	3	11	1	10	3	12	6	6	12	11	1	11	1
Total	419	223	398	260	308	340	513	430	230	511	408	206	413	216

For the Amendment, 107.
Against the Amendment, 163.

DEER LODGE COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress				Associate Justice		Representatives				
	Evans, D	Dixon, R	Sproule, S	Dee, L	Leslie, D	Holloway, R	Cameron, S	Trippet, D	Burke, D	Evans, D	Sladish, D
Anaconda, Precinct No. 1	107	130	68	29	153	155	52	120	98	138	47
Anaconda, Precinct No. 2	103	135	30	23	179	160	21	142	103	115	47
Anaconda, Precinct No. 3	95	117	31	48	114	181	20	111	92	125	44
Anaconda, Precinct No. 4	83	102	58	66	122	170	42	87	101	112	44
Anaconda, Precinct No. 5	36	60	19	22	57	71	17	47	28	41	12
Anaconda, Precinct No. 6	94	71	47	80	133	157	36	93	102	86	71
Anaconda, Precinct No. 7	45	62	40	50	83	115	25	44	52	54	26
Anaconda, Precinct No. 8	128	59	46	61	141	143	30	111	122	117	64
Anaconda, Precinct No. 9	75	75	61	77	122	137	48	66	77	81	39
Lost Creek, Precinct No. 10	8	26	1	4	7	40	1	5	2	6	1
Modesty, Precinct No. 11	10	14	2	.....	5	25	2	6	5	7	1
Warm Springs, Precinct No. 12	9	18	3	3	13	23	1	13	11	11	10
Stuart, Precinct No. 13	5	9	1	4	2	29	.....	1	1	3	.....
Mill Creek, Precinct No. 14	7	16	1	5	4	44	.....	12	8	8	2
Blue-Eyed Nellie, Precinct No. 15	19	24	5	7	22	39	2	22	22	25	38
Silver Lake, Precinct No. 16	7	1	.....	1	4	5	.....	4	3	8	.....
Georgetown, Precinct No. 17	6	2	.....	.....	5	3	.....	5	6	5	3
Cable, Precinct No. 18	9	.....	2	1	6	5	2	10	7	8	4
Total	846	971	415	481	1,178	1,502	299	899	838	941	423

DEER LODGE COUNTY—Continued.

PRECINCTS	Sheriff			Treasurer			Clerk and Recorder			Assessor		
	Walsh, D.....	Burnett, R.....	Storrrar, L.....	Lawler, D.....	Tuttle, R.....	Denny, L.....	Greenan, D.....	Gnose, R.....	White, L.....	Murphy, D.....	Peterson, R.....	Levengood, L.....
Anaconda, Precinct No. 1.....	98	123	155	68	114	190	114	121	137	106	118	111
Anaconda, Precinct No. 2.....	122	165	96	86	164	111	124	162	78	124	137	92
Anaconda, Precinct No. 3.....	100	141	102	92	110	118	121	114	82	115	112	90
Anaconda, Precinct No. 4.....	111	131	133	86	101	161	120	121	106	111	105	127
Anaconda, Precinct No. 5.....	33	63	66	31	60	63	54	56	41	33	75	46
Anaconda, Precinct No. 6.....	131	79	176	149	60	134	142	64	154	116	61	164
Anaconda, Precinct No. 7.....	68	61	121	77	50	104	68	60	102	55	68	100
Anaconda, Precinct No. 8.....	137	78	160	139	61	145	157	48	133	125	64	149
Anaconda, Precinct No. 9.....	90	78	163	103	67	141	97	74	136	80	92	126
Lost Creek, Precinct No. 10.....	18	23	11	9	15	21	11	24	14	8	30	13
Modesty, Precinct No. 11.....	15	16	3	13	16	2	20	10	3	13	14	2
Warm Springs, Precinct No. 12.....	18	22	8	15	22	10	16	21	9	14	25	6
Stuart, Precinct No. 13.....	28	3	1	12	5	3	14	7	4	14	6	7
Mill Creek, Precinct No. 14.....	26	19	6	19	19	5	21	16	6	13	24	8
Blue-Eyed Nellie, Precinct No. 15.....	37	18	13	28	18	13	21	30	13	20	26	15
Silver Lake, Precinct No. 16.....	4	6	.....	7	1	2	9	1	.....	7	3	.....
Georgetown, Precinct No. 17.....	6	3	.....	5	3	1	6	2	1	5	2	2
Cable, Precinct No. 18.....	8	5	.....	7	2	3	8	4	1	8	3	2
Totals	1,050	1,034	1,214	946	888	1,250	1,123	985	1,023	967	965	1,099

DEER LODGE COUNTY--Continued.

PRECINCTS	Attorney			Supt. of Schools			Coroner			Public Adm'r		Surveyor		
	Boarman, D.....	Rodgers, R.....	McCaffery, L.....	McLaughlin, D.....	Marchion, R.....	Mahoney, L.....	Faunt, D.....	Reese R.	Walsh, L.....	Fitzgerald, D.....	Wisner R.....	McIntosh, D.....	Lord, R.....	Tobin, L.....
Anaconda, Precinct No. 1.....	120	115	137	114	155	108	52	124	185	92	163	83	130	141
Anaconda, Precinct No. 2.....	123	145	101	73	216	77	57	136	164	107	179	108	143	90
Anaconda, Precinct No. 3.	126	106	101	99	157	85	59	115	140	110	138	88	118	103
Anaconda, Precinct No. 4.....	103	95	157	100	118	139	49	122	166	103	127	79	103	144
Anaconda, Precinct No. 5.....	31	56	71	31	69	56	21	63	67	41	72	24	65	61
Anaconda, Precinct No. 6.....	96	51	214	115	65	193	58	77	198	105	66	67	56	204
Anaconda, Precinct No. 7.....	45	52	133	66	79	109	23	67	128	53	75	27	61	127
Anaconda, Precinct No. 8.....	102	48	196	146	47	169	67	58	193	126	58	66	47	183
Anaconda, Precinct No. 9.....	60	72	185	81	97	154	37	77	183	83	87	43	53	193
Lost Creek, Precinct No. 10.....	8	14	23	21	21	9	16	21	12	11	23	6	19	17
Modesty, Precinct No. 11.....	16	13	3	11	19	3	18	12	2	13	17	13	13	5
Warm Springs, Precinct No. 12.....	13	21	12	22	21	5	16	20	8	17	22	14	21	7
Stuart, Precinct No. 13.....	10	7	5	27	4	1	11	8	8	10	9	11	6	2
Mill Creek, Precinct No. 14.....	12	15	20	23	18	6	10	26	9	16	26	7	22	13
Blue-Eyed Nellie, Precinct No. 15.....	21	30	15	37	20	11	22	21	21	20	22	16	26	15
Silver Lake, Precinct No. 16.....	8	.....	2	8	2	.....	9	.....	.....	9	1	4	6	.....
Georgetown, Precinct No. 17.....	6	2	1	8	1	.....	4	3	.....	6	2	8	1	.....
Cable, Precinct No. 18.....	8	4	1	10	3	.....	10	2	.....	6	5	10	2	1
Total	908	846	1,377	992	1,112	1,116	539	952	1,486	928	1,092	674	898	1,306

For the Amendment, 623.
Against the Amendment, 683.

FERGUS COUNTY—Continued.

PRECINCTS	Clerk		Co. Att'y		Assessor		Supt. Schools		Surveyor		Coroner		Public Adm'r		For Amendment.....		Against Amendment		Jail	
	Kelly, R.....	Hazen, D.....	Belden, R.....	MacGowan, D.	Fowler, R....	Pick, D.....	McKee, R ...	Meyersick, D.	Stafford, R....	Hogeland, D..	David, R. ...	Treacy, D. ...	Day, R.	Nave, D.....	16	5	10	15	Jail Prop., For	Jail Prop., Against
Stanford	46	24	37	32	44	25	28	39	36	32	42	23	43	22	22	16	5	10	15	
Wareham	14	8	15	7	12	10	13	8	13	8	15	5	14	6	10	10	...	9	2	
Philbrook ..	38	17	43	12	32	21	26	28	34	20	38	16	41	13	26	5	...	2	43	
Utica	73	35	69	35	65	43	47	62	64	40	72	37	62	38	27	13	...	18	26	
Cottonwood ..	28	50	38	38	16	62	10	70	40	39	35	36	46	20	18	40	...	9	54	
Trout Creek ..	21	11	21	11	18	14	11	21	18	13	21	11	20	10	8	6	...	7	7	
Ubet	43	34	45	33	44	35	19	61	39	41	40	39	45	31	15	23	...	15	25	
Upper Cottonwood	22	19	26	12	7	31	13	32	25	18	23	13	31	12	14	6	...	5	17	
Ross' Fork ..	19	8	13	14	12	16	12	16	18	8	19	6	19	7	6	6	...	3	13	
West Lewistown	199	238	265	154	195	243	137	198	227	195	197	205	247	171	104	91	...	162	52	
East Lewistown	96	84	96	72	74	111	56	125	86	86	82	75	88	76	33	54	...	52	37	
East Fork	25	7	23	6	21	11	11	21	22	10	20	3	22	7	20	4	...	16	8	
Deerfield	15	11	19	8	9	17	7	19	9	16	17	8	19	7	8	5	...	5	8	
Maiden	18	46	18	39	11	51	8	56	15	45	18	41	22	37	8	17	...	9	18	
Moccasin	12	5	12	4	8	16	3	19	8	13	8	12	13	10	2	9	...	...	11	
Moccasin City	12	5	12	4	8	16	3	19	14	3	12	4	12	4	2	7	...	4	7	
Grass Range	38	9	32	11	28	18	24	22	39	16	29	14	33	12	...	...	...	...	...
Forest Grove	22	17	30	7	23	14	19	19	22	15	28	7	30	6	20	3	...	12	13	
Stuart	25	15	18	17	7	33	18	20	23	15	22	10	25	13	6	12	...	6	11	
Box Elder	18	15	23	11	15	19	7	25	20	12	19	15	20	13	8	2	...	10	1	
Alder Grove (No vote cast.) .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Judith	9	3	11	1	7	5	1	10	9	3	9	1	10	1	1	3	...	3	2	
Gilt Edge	55	215	95	164	55	213	89	190	88	176	83	167	91	166	37	46	...	41	42	
Flatwillow	14	6	12	9	8	12	4	18	14	6	11	9	12	8	...	7	...	1	6	
Cruse	5	10	6	9	2	13	6	9	3	12	4	11	5	9	3	4	...	4	2	
Musselshell	5	4	4	6	3	6	4	5	2	7	4	5	5	4	2	...	...	1	2	
Guntton	24	14	25	12	22	16	21	17	22	14	27	10	26	11	15	10	...	11	14	
Lavina	10	4	10	4	9	5	6	8	11	3	10	4	11	3	8	...	...	2	5	
Kendall	70	122	85	98	65	126	48	147	70	121	68	114	75	109	48	37	...	48	43	
Elso	10	1	9	2	5	6	5	6	6	5	8	3	7	3	6	2	...	1	10	
Findon	10	7	11	6	8	9	8	8	5	14	8	7	9	8	1	6	...	...	6	
Wildor	10	5	10	5	10	5	10	5	10	5	10	5	10	5	5	1	...	5	...	
New Year	6	20	12	16	9	19	6	22	9	19	9	17	10	17	2	14	...	13	...	
Whiskey Gulch	10	14	12	12	10	13	12	10	11	12	10	12	9	12	7	...	...	6	2	
Yogo	23	15	22	17	13	22	4	38	18	17	16	21	16	18	5	7	...	5	5	
Rockford	14	20	14	19	13	23	6	28	10	23	12	20	14	18	3	17	...	6	17	
Edgewater	11	...	...	1	8	23	7	5	9	2	10	1	10	2	4	6	...	3	7	
Eversqn	2	6	4	4	1	5	...	3	3	5	2	5	6	1	...	7	...	1	6	
Weede... ..	7	3	8	3	9	2	7	3	3	7	7	3	7	3	4	2	...	1	5	
Totals	1,079	1,131	1,217	917	903	1,298	723	1,505	1,066	1,096	1,065	1,000	1,185	922	502	481	...	498	560	

FLATHEAD COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress			Asso. Justice		Senator	Representatives												
	Eyans, D.....	Dixon, R	Sproule, S.....	Dee, L.....	Leslie, D.....	Holloway, R	Cameron, S.....	King, D.....	Brennan, R.....	Wreith, S.....	Thurman, D.....	Bailey, D	Anderson, D.....	Hilman, R.....	Cannon, R.....	Noble, R.....	Blush, S.....	Halvertson, S.....	Billings, S.....
Kalispell No. 1	131	192	23	1	126	194	21	127	193	25	189	112	108	189	191	190	20	24	21
Kalispell No. 2.....	173	226	47	...	159	241	41	193	221	42	187	131	158	201	223	224	39	35	34
Helena Flats, 3.....	18	26	1	...	16	25	1	24	21	1	22	17	18	26	28	26	1	1	1
Stillwater, 4.....	59	46	3	...	56	44	4	51	47	6	56	54	53	43	47	45	3	4	...
Sedan, 5.....	24	28	2	...	23	30	2	29	26	2	24	20	21	28	30	28	...	...	...
Marion, 6.....	6	11	...	1	5	12	...	10	8	1	8	4	6	6	13	9	...	...	1
Pleasant Valley, 7.....	13	14	2	...	14	12	2	13	10	3	12	10	13	14	17	11	2	2	2
Bad Rock, 8.....	32	32	6	1	30	34	6	24	38	9	21	23	32	44	31	29	7	5	7
Fair View, 9.....	14	34	3	2	11	37	4	18	32	4	15	12	13	33	29	29	3	3	3
Egan, 10.....	12	24	6	...	13	26	5	17	22	4	17	15	17	21	22	19	4	3	4
Creston, 11.....	25	30	5	...	24	28	5	21	38	5	21	18	19	32	30	31	5	4	5
Holt, 12.....	41	66	10	2	35	73	12	45	73	11	39	39	40	71	67	65	9	12	17
Columbia Falls, 13.....	71	109	11	3	48	133	11	67	103	15	50	50	51	148	109	102	10	9	12
Belton, 14.....	9	13	5	1	8	14	3	13	14	2	6	8	8	22	15	13	1	3	3
Essex, 15.....	10	1	5	...	7	3	4	8	5	3	9	8	9	2	1	1	4	4	4
Whitefish, 16.....	24	22	...	...	20	24	1	21	20	...	23	21	19	22	22	19	...	...	...
Spring Prairie, 17.....	7	14	...	...	7	14	...	8	14	...	7	6	9	15	13	13	...	...	...
Tobacco Plains, 18.....	62	58	...	1	60	58	...	65	53	1	60	55	79	46	48	38	2	1	1
Marston, 19.....	15	58	...	1	17	13	1	15	14	1	14	9	13	25	26	23	1	1	1
Demersville, 20.....	17	14	...	...	17	13	9	68	97	10	69	53	53	84	77	86	6	9	7
Brocken, 21.....	73	83	8	...	67	88	...	12	30	...	13	13	11	27	28	27	...	...	...
Dayton, 22.....	12	29	...	...	11	28	...	66	46	6	57	50	54	51	52	46	5	5	6
Libby, 23.....	53	53	7	1	48	59	7	66	46	...	10	7	11	6	13	6	...	...	...
West Fisher, 24.....	8	6	...	3	6	10	...	8	9	...	10	4	3	5	5	4	...	...	...
Howard, 25.....	4	4	...	...	4	4	...	3	4	...	4	3	3	5	5	4	...	...	...
Jennings, 26.....	10	10	1	1	6	14	...	8	15	1	10	10	10	11	9	9	1	1	1
Troy, 27.....	24	28	...	...	23	28	...	25	26	...	31	24	25	25	26	23	...	...	...
Sylvanite, 28.....	1	4	...	...	...	5	...	...	4	...	1	...	...	5	5	4	...	...	...
Snow Shoe, 29.....	7	5	...	...	4	7	...	...	7	...	...	...	...	6	6	6	...	...	...
Patavia, 30.....	19	24	6	...	21	22	7	23	23	6	20	14	18	23	24	23	6	6	6
Totals	970	1,224	153	18	885	1,304	147	1,004	1,236	160	975	808	898	1,254	1,217	1,169	139	132	138

FLATHEAD COUNTY—Continued.

PRECINCTS	County Commissioners								Sheriff		Treasurer		Clerk & Recorder					
	Bockman, D.....	Therriault, D.....	Lee, D.....	Peltier, R.....	Brintnall, R.....	Adams, R.....	Peterson, S.....	Rech, S.....	Bryant, S.....	Hand, D.....	Gregg, R.....	Larson, S.....	Hilburn, D.....	Weberg, R.....	Clausen, S.....	Lagoni, D.....	Walker, R.....	Gildea, S.....
Kalispell No. 1.....	133	159	90	138	165	227	48	16	22	158	179	20	188	147	22	165	175	16
Kalispell No. 2.....	186	171	132	186	192	251	73	31	29	200	252	30	232	189	32	201	235	27
Helena Flats, 3.....	45	15	21	24	24	33	1	1	2	17	28	2	20	27	....	16	31	1
Stillwater, 4.....	42	55	43	41	55	63	16	2	2	67	38	7	56	52	....	58	50	1
Sedan, 5.....	23	26	19	29	28	31	1	1	2	21	36	1	33	22	1	27	27	1
Marion, 6.....	10	11	4	5	6	12	....	....	....	8	10	....	9	6	....	13	3	1
Pleasant Valley, 7.....	19	16	9	9	10	15	2	2	2	16	10	2	14	12	2	15	12	2
Bad Rock, 8.....	21	29	50	23	32	24	5	3	1	37	30	6	35	27	6	34	34	5
Fair View, 9.....	8	11	18	19	41	28	5	2	2	20	30	4	17	32	4	17	34	4
Egan, 10.....	17	17	18	22	24	35	3	3	2	22	22	4	17	20	10	22	18	4
Creston, 11.....	15	23	31	24	30	34	6	3	3	31	29	6	28	29	7	25	37	4
Holt, 12.....	39	52	37	64	69	83	16	3	4	56	65	8	48	67	8	59	62	6
Columbia Falls, 13.....	70	83	104	84	86	82	9	7	6	71	108	12	81	99	8	73	112	6
Belton, 14.....	10	15	16	10	13	12	1	1	1	13	16	1	15	10	1	18	9	....
Essex, 15.....	8	8	8	1	1	2	4	4	3	9	6	1	13	....	2	11	1	3
Whitefish, 16.....	18	22	27	26	15	16	3	1	1	23	23	1	24	22	1	27	20	....
Spring Prairie, 17.....	7	10	3	13	12	17	1	....	....	11	9	2	11	11	....	5	17	....
Tobacco Plains, -18.....	60	75	25	112	40	43	....	....	1	73	52	....	71	50	1	74	49	....
Marston, 19.....	20	24	5	28	6	6	....	....	....	16	14	2	16	11	1	18	12	....
Demersville, 20.....	10	21	13	19	24	32	5	2	1	12	33	....	28	15	1	26	18	....
Brocken, 21.....	54	61	64	73	77	95	17	7	6	93	73	7	90	70	8	74	90	6
Dayton, 22.....	14	25	14	22	20	24	....	....	1	27	16	....	25	16	....	23	20	....
Libby, 23.....	81	56	43	41	37	57	2	5	4	59	54	7	71	41	4	67	43	5
West Fisher, 24.....	17	12	10	4	4	5	....	....	....	9	9	....	15	3	....	16	2	....
Howard, 25.....	2	3	3	5	5	6	....	....	....	3	5	....	3	5	....	3	5	....
Jennings, 26.....	16	11	8	9	10	10	....	1	1	15	7	1	13	8	1	10	11	1
Troy, 27	29	28	18	20	26	26	....	1	....	30	24	....	29	25	....	29	26	....
Sylvanite, 28.....	3	2	....	3	5	2	....	....	....	....	5	....	1	4	....	4	1	....
Snow Shoe, 29.....	10	5	4	6	5	6	....	....	....	5	7	....	7	4	1	3	9	....
Batavia, 30	23	15	17	17	23	24	12	4	3	18	28	8	19	32	1	16	31	4
Total	990	1,061	854	1,074	1,085	1,291	230	100	99	1,140	1,218	132	1,229	1,056	122	1,149	1,194	97

FLATHEAD COUNTY- Continued.

PRECINCTS	Assessor		Attorney		Supt. of Schools		Coroner		Public Administrator		Surveyor				
	Seeley, R.....	Yenne, S.....	McKeown, D.....	Poorman, R.....	Valentine, D.....	Steere, R.....	Rosencranz, S.....	McMahon, D.....	Willoughby, R.....	Tiesing, S.....	Clark, D.....	Latimer, R.....	Snyder, S.....	Jenkins, D.....	Gibson, R.....
Kalispell No. 1.....	194	138	18	194	118	224	16	139	190	20	202	115	22	122	203
Kalispell No. 2.....	232	178	44	202	142	260	19	192	237	30	198	207	31	158	265
Helena Flats, 3.....	27	20	.....	17	18	28	.....	19	27	.....	.....	25	.....	19	26
Stillwater, 4.....	59	47	3	50	40	63	5	56	43	6	50	50	4	55	50
Sedan, 5.....	34	19	1	25	29	23	1	27	27	1	26	26	1	21	34
Marion, 6.....	14	2	1	6	6	11	.....	8	6	2	6	9	1	5	11
Pleasant Valley, 7.....	18	9	2	10	17	10	2	10	17	2	12	14	2	7	20
Bad Rock.....	32	33	7	32	42	27	3	17	53	2	35	27	6	35	34
Fair View, 9.....	16	31	6	11	41	32	4	16	35	4	19	28	4	17	33
Egan, 10.....	13	23	5	24	19	22	4	14	25	5	17	22	5	18	24
Creston, 11.....	21	32	13	28	21	37	3	23	36	3	25	31	4	25	31
Holt, 12.....	54	60	13	54	54	69	6	53	66	8	32	83	8	39	81
Columbia Falls, 13.....	90	93	9	69	123	61	9	51	132	8	74	97	12	77	112
Belton, 14.....	16	10	2	16	22	6	2	10	16	2	11	12	2	9	16
Essex, 15.....	11	1	2	10	4	.....	1	11	.....	3	11	.....	3	9	3
Whitefish, 16.....	22	23	2	22	23	22	1	17	28	1	26	19	1	21	25
Spring Prairie, 1.....	13	9	.....	4	5	17	.....	9	12	.....	8	11	.....	7	14
Tobacco Plains, 18.....	79	45	1	55	70	54	1	59	64	1	66	55	2	62	57
Marston, 19.....	18	12	1	16	9	22	.....	14	12	1	14	14	2	14	17
Demersville, 20.....	20	22	2	22	15	26	1	20	20	1	18	22	1	14	27
Brocken, 21.....	86	76	9	89	72	96	5	74	85	6	78	45	5	73	89
Dayton, 22.....	21	22	.....	15	19	22	.....	11	28	2	14	27	.....	15	26
Libby, 23.....	58	56	3	58	71	43	5	64	45	4	58	47	6	92	22
West Fisher, 24.....	10	8	.....	12	16	2	.....	10	8	.....	10	8	.....	14	4
Howard, 25.....	4	4	.....	4	5	3	.....	3	4	.....	3	4	.....	6	1
Jennings, 26.....	13	10	1	15	12	10	1	11	9	1	11	11	1	10	11
Troy, 27.....	30	23	.....	23	16	38	.....	24	29	.....	26	28	.....	23	31
Sylvanite, 28.....	2	3	.....	5	.....	5	.....	1	4	.....	.....	5	.....	.....	5
Snow Shoe, 29.....	5	4	.....	7	4	8	.....	5	7	.....	.....	7	.....	6	6
Batavia, 30.....	19	23	6	28	18	30	4	17	26	7	20	22	8	19	30
Totals	1,236	1,039	151	1,110	1,069	1,271	103	985	1,291	120	1,098	1,101	131	492	1,313

For the Amendment, 463.
Against the Amendment, 299.

GALLATIN COUNTY—ELECTIONS RETURNS—Continued.

PRECINCTS	Congress		Asso. Justice		Representatives						Sheriff		Treasurer	
	Evans, D.....	Dixon, R	Leslie, D.....	Holloway, R.....	Martin, D.....	Morgan, D.	Campbell, D.....	Kidd, R.....	Story, R.....	Sales, R.....	Ferguson, D.....	Fowler, R.....	Blakeley, D.....	Flanders, R.....
East Bozeman	169	172	135	224	171	153	126	160	187	177	187	189	189	161
South Bozeman	123	154	106	178	137	121	94	145	160	150	112	182	133	114
West Bozeman	132	199	147	225	171	106	112	192	220	200	153	234	154	222
Baker	8	10	6	12	9	12	5	6	8	10	10	8	9	9
Belgrade	78	63	71	71	73	87	62	54	62	66	78	67	71	71
Bridge	11	37	9	39	9	12	8	38	31	32	14	34	13	34
Chesnut	39	52	49	51	37	23	21	41	45	40	47	54	68	33
Connell	19	13	18	13	19	17	15	12	13	12	17	15	17	13
Flathead	37	27	35	30	32	43	29	27	26	21	40	27	37	25
Gallatin	22	40	18	46	23	23	17	39	34	38	21	43	22	37
Hillsdale	41	7	35	12	37	37	33	7	8	9	36	12	39	8
Madison	11	14	6	20	11	12	10	14	12	14	12	15	13	13
Middle Creek	22	12	19	16	23	22	19	14	14	14	16	20	22	14
Monforton	29	29	30	29	35	27	26	24	26	21	36	24	26	32
Manhattan	30	48	26	52	27	29	27	41	41	55	32	47	29	46
Reese Creek	19	13	20	13	18	16	16	14	14	14	20	13	14	18
Salesville	63	50	55	62	69	66	61	45	45	50	65	51	62	53
Spanish Creek	13	5	11	7	13	13	9	6	5	4	11	7	11	7
Springhill	20	25	19	27	19	20	21	25	25	21	23	24	15	31
Three Forks	19	3	13	8	19	20	19	2	3	3	21	1	19	3
West Gallatin	22	34	14	40	21	26	18	24	32	30	27	32	17	37
Willow Creek	28	15	25	19	29	31	30	14	12	13	27	17	23	21
Willow	3	28	2	29	3	3	3	29	23	23	7	25	5	25
Holland .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Greyling (No election held) .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maudlow	11	11	9	12	11	15	11	10	10	8	14	10	11	10
Basin	4	4	1	7	4	3	4	4	5	5	9	2	4	7
Totals	1,023	1,064	879	1,242	1,020	996	796	987	1,061	1,032	1,035	1,156	1,023	1,077

GALLATIN COUNTY—Continued.

PRECINCTS	Clk. & Rec'd'r	Co. Att'y	Assessor	Supt. Schools	Surveyor		Coroner	Pub. Admr	
					Thorpe, D.....	Walker, R.....		Finlay, D.....	Trent, R.....
East Bozeman	187	170	166	211	191	152	157	194	171
South Bozeman	138	143	157	131	166	122	120	175	136
West Bozeman	196	183	199	152	223	150	186	187	106
Parker	8	10	13	3	9	9	7	11	10
Belgrade	53	89	65	34	102	39	74	60	58
Pridger	14	33	32	33	17	29	12	35	33
Chestnut	54	50	81	71	62	51	56	43	43
Connell	8	23	15	13	20	10	14	17	14
Flathead	31	32	26	24	40	22	36	29	26
Gallatin	33	38	44	34	30	33	24	37	35
Hillsdale	32	13	10	8	38	6	36	5	5
Madison	8	19	17	10	16	10	11	15	13
Middle Creek	23	14	17	11	20	15	22	13	14
Monforton	35	22	25	19	37	18	28	32	22
Manhattan	36	41	44	32	42	33	30	44	42
Roose Creek	18	15	21	19	21	12	13	18	13
Salesville	61	50	58	35	76	37	63	48	38
Spanish Creek	7	10	8	3	14	4	12	5	4
Springhill	16	31	28	13	26	21	19	23	20
Three Forks	17	4	5	3	21	2	18	4	4
West Gallatin	14	44	29	21	27	28	18	34	30
Willow Creek	34	10	16	11	33	10	28	15	14
Holland	5	25	27	22	7	25	9	21	26
Greyling (No election held).....	..	..	..	..	..	..	..	..	..
Maudow	12	11	11	5	16	6	12	9	9
Basin	10	2	10	1	10	..	6	5	4
Totals	1,040	1,082	1,130	829	1,263	844	1,011	1,070	950

For the Amendment, 578.
Against the Amendment, 438.

GRANITE COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress				Associate Justice		State Senator				
	Dee, P. and L.....	Dixon, R.....	Evans, D.....	Sproule, S.....	Holloway, R.....	Leslie, D.....	Cameron, S.....	Hynes, Bryan D. and Silver R.....	Power, R.....	Bevan, L.....	Durham, D.....
Philipsburg North, No. 1....	15	83	73	4	118	68	5	65	75	4	73
Philipsburg South, No. 2....	38	99	74	1	149	68	2	86	77	7	79
Combination No. 3.....	1	2	2	.....	3	2	.....	2	1	.....	2
Quigley No. 4.....	1	14	3	.....	11	4	.....	.....	.....	.....	.....
Rock Creek No. 5.....	2	14	12	.....	16	11	1	7	15	1	10
Bi-Metallic No. 6.....	3	17	17	.....	22	16	1	10	16	3	12
Granite No. 7.....	84	61	110	1	149	121	1	40	39	94	108
Princeton No. 8.....	5	1	2	.....	10	2	.....	15	1	.....	2
Sunrise No. 9.....	9	10	21	.....	23	22	.....	3	7	6	37
Stones No. 10.....	6	19	22	.....	33	19	.....	21	17	2	18
New Chicago No. 11.....	9	40	6	.....	52	6	1	17	38	6	6
Drummond No. 12.....	4	31	38	.....	35	35	.....	12	23	5	37
Bearmouth No. 13.....	1	12	11	1	13	12	1	5	12	.....	11
Garnet No. 14.....	18	63	16	.....	83	19	.....	25	50	13	12
Moose Lake No. 15.....	1	6	1	.....	7	1	.....	6	3	.....	1
Porter's No. 16.....	3	8	4	.....	11	2	.....	6	6	.....	1
Royal No. 17.....	16	6	3	1	25	1	.....	17	5	10	2
Hasmark No. 18.....	8	4	5	.....	13	3	1	14	4	.....	1
Totals	224	490	420	8	773	412	15	351	389	151	405

GRANITE COUNTY—Continued.

PRECINCTS	Representatives										County Commissioners					
	McLeod, Bryan D. and Silver R..	McDonald, Bryan D. and Silver R..	Fox, L.....	Hanifer, L.....	Hocking, R.....	Lehson, R.....	Arthur, D.....	Johnson, D.....	Allison, Bryan D. and Silver R..	Henderson, R., S. R., Bryan D. and L.....	Duffy, Bryan D., Silver R. and L..	Rupp, D.....	Beley, R.....	Metcalf, R.....	Wight, D.....	Norris, D.....
Phillipsburg North, No. 1....	65	44	9	4	71	68	55	56	80	109	101	69	90	85	39	39
Phillipsburg South, No. 2.....	60	47	9	6	78	76	72	63	67	138	118	104	74	99	55	45
Combination No. 3.....	2	2	.....	.....	1	1	2	2	3	2	4	3	.....	.....	1	2
Quigley No. 4.....	2	.....	.....	.....	10	9	6	5	.....	6	1	6	11	7	3	9
Rock Creek No. 5.....	12	2	3	1	8	15	10	7	7	17	26	10	15	18	2	2
Bi-Metallie No. 6.....	7	8	2	1	10	13	18	16	6	9	10	32	9	11	21	22
Granite No. 7.....	19	20	82	52	65	30	149	145	43	93	79	181	63	92	123	118
Princeton No. 8.....	11	8	2	.....	1	1	5	3	12	16	14	2	2	5	3	.....
Sunrise No. 9.....	2	1	9	6	9	10	24	23	3	15	13	32	17	14	14	19
Stones No. 10.....	14	9	2	2	14	15	20	20	22	36	26	22	11	8	31	16
New Chicago No. 11.....	22	11	6	5	26	32	7	7	26	62	28	7	21	23	15	9
Drummond No. 12.....	10	10	4	3	25	30	30	17	16	49	17	23	16	22	33	53
Bearmouth No. 13.....	2	4	3	7	10	11	11	6	4	21	6	9	8	13	12	10
Garnet No. 14.....	6	19	12	31	37	80	12	5	18	70	44	25	49	51	15	24
Moose Lake No. 15.....	1	1	4	1	2	4	1	.....	2	4	7	2	6	7	1	1
Porter's No. 16.....	3	2	2	2	7	8	.....	1	8	12	10	1	2	8	1	.....
Royal No. 17.....	15	7	8	15	5	6	4	3	9	28	24	10	12	7	4	2
Hasmark No. 18.....	6	7	1	4	3	5	4	5	8	10	12	4	8	9	1	.....
Totals	259	205	158	140	382	414	430	344	331	697	540	542	414	479	377	362

GRANITE COUNTY—Continued.

PRECINCTS	Sheriff		Clerk and Recorder			Treasurer		Assessor					
	Schoonover, Bryan D., S. R. and L..	Boyd, R.....	McDonald, D.....	Neu, Bryan D., Silver R. and L..	Dyer, R.....	Kaiser, D.....	Kroger, Bryan D. and Silver R....	Tinklepaugh, R...	Bradshaw, L.....	McDonel, D	Ballard, Bryan D. and Silver R....	Enderlein, L., D...	Scott, R.....
Phillipsburg North, No. 1.....	91	73	56	73	32	106	104	38	22	46	92	49	79
Phillipsburg South, No. 2.....	93	70	90	85	46	107	111	46	20	62	120	53	60
Combination No. 3.....	2	.....	3	2	1	2	1	1	1	2	3	2	.....
Quigley No. 4..	5	6	6	5	6	5	3	9	.....	3	2	3	9
Rock Creek No. 5....	17	5	9	17	5	9	11	4	1	15	10	5	16
Bi-Metallic No. 6.....	14	8	19	17	4	19	11	6	10	15	10	25	7
Granite No. 7.....	77	86	127	81	101	104	69	20	61	113	37	226	19
Princeton No. 8.....	10	2	6	16	.....	2	11	2	3	1	16	.....	1
Sunrise No. 9.....	10	7	29	11	9	25	4	3	25	12	8	23	12
Stones No. 10	18	10	31	29	7	23	18	12	7	22	11	9	38
New Chicago No. 11.....	28	23	17	32	20	14	10	49	2	4	17	3	40
Drummond No. 12	18	14	53	31	14	33	17	20	4	40	28	20	31
Bearmouth No. 13	6	5	18	8	7	12	3	12	4	9	5	11	13
Garnet No. 14.....	27	35	45	45	34	24	35	31	15	20	28	27	44
Moose Lake No. 15	7	2	1	6	1	3	7	.....	.....	1	3	1	6
Porter's No. 16....	10	4	1	9	2	4	6	6	.....	3	7	2	5
Royal No. 17..	21	7	8	26	4	3	16	3	.....	.....	18	13	4
Hasmark No. 18.....	3	9	5	12	3	3	15	.....	3	.....	13	3	3
Totals	457	366	524	505	296	493	452	262	194	369	428	475	387

GRANITE COUNTY--C. ntinued.

PRECINCTS	County Attorney			Supt. Schools			Surveyor			Coroner			Public Administrator		
	Maywood, L., D..	Shull, R.....	Durfee, D.....	Ryan, Bryan D. and Silver R.....	Clark, L., R.....	Smith, D.....	Doynes, Bryan D., Silver R. and L...	Wilson, R.....	Crulle, D.....	Getty, Bryan D., Silver R.....	Craven, R.....	Ray, D.....	Matthews, Bryan D., Sil. R. and L.	Axtell, R.....	McBee, D.....
Philipsburg North, No. 1.....	66	90	53	130	65	16	80	69	64	106	50	49	89	87	30
Philipsburg South, No. 2.....	73	73	90	135	68	41	101	68	69	112	55	65	102	72	46
Combination No. 3.....	91	.....	3	2	2	1	1	1	3	1	1	2	3	.....	1
Quigley No. 4.....	.....	13	1	6	10	.....	.....	9	5	1	12	2	1	.....	2
Rock Creek No. 5.....	7	15	10	12	18	2	8	14	8	15	8	7	16	11	3
Pa-Metallie No. 6.....	16	12	14	19	11	10	11	13	17	12	9	17	11	13	16
Granite No. 7.....	96	41	140	93	99	8	87	32	153	62	42	134	69	60	114
Princeton No. 8.....	15	.....	2	9	7	.....	4	4	7	16	.....	1	13	2	.....
Sunrise No. 9.....	11	12	21	26	14	5	6	8	28	7	7	27	11	10	18
Stones No. 10.....	14	20	18	19	29	13	10	14	34	12	22	20	16	21	12
New Chicago No. 11.....	16	32	15	32	33	1	15	25	21	12	43	4	21	33	5
Drummond No. 12.....	13	24	44	34	22	22	6	24	45	6	48	22	14	27	29
Bearmouth No. 13.....	3	11	15	19	1	8	3	10	14	2	13	11	3	10	13
Garnet No. 14.....	29	53	24	27	63	15	14	55	32	20	52	24	23	57	18
Moose Lake No. 15.....	1	2	6	8	1	1	7	.....	3	8	1	.....	7	2	1
Porter's No. 16.....	6	5	4	11	3	.....	11	4	.....	6	4	.....	6	6	2
Royal No. 17.....	21	6	6	12	22	1	24	7	1	13	8	3	22	7	1
Hasmark No. 18.....	5	9	5	13	4	.....	12	5	1	11	3	3	12	6	1
Totals	394	424	471	607	472	224	400	363	505	423	378	393	439	436	312

For the Amendment, 212.
Against the Amendment, 187.

JEFFERSON COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress				Associate Justice		Senator	Representatives							
	Evans, D....	Dixon, R.....	Dee, L.....	Sproule, S....	Leslie, D....	Holloway, R..	Cameron, S...	Sherlock, D...	Morrison, R..	Flaherty, D...	Downey, D...	Wickham, D...	Dalley, R....	MacDonald, R	Simpkins, R..
Big Indian	5	5	1	1	2	10	1	6	6	4	2	5	9	10	7
Wickes	21	37	12	3	15	56	3	39	38	28	35	19	63	35	33
Clancy	44	57	3	19	3	68	13	66	52	56	52	43	49	70	50
Corbin	17	20	.....	2	16	23	3	21	21	19	15	13	21	20	27
Boulder	116	89	6	2	106	110	2	132	88	132	114	76	80	91	115
Gregory	7	4	.....	2	9	3	2	9	4	10	8	9	5	2	3
Ten Mile	8	7	1	.....	10	7	.....	10	7	11	8	7	6	9	5
Mitchell	4	11	.....	.....	5	11	.....	5	11	5	4	2	11	10	14
Bevansville	4	4	2	.....	1	10	.....	1	9	3	6	2	3	9	9
Mocking Bird	5	3	1	.....	1	5	.....	6	3	5	4	4	4	6	4
Jefferson	18	15	2	1	17	18	1	18	18	18	15	10	23	11	21
Lower Boulder	25	7	.....	.....	25	8	.....	26	7	28	20	30	2	5	9
Elkhorn	29	17	2	.....	25	20	1	31	14	31	23	18	16	17	21
Whitehall	93	124	14	2	6	166	2	66	187	143	87	97	93	123	109
Jefferson River	3	5	.....	.....	3	6	.....	8	1	9	3	5	.....	4	4
Bernice	1	12	2	1	.....	15	1	9	8	4	8	5	10	10	12
Homestake	7	18	10	1	4	31	2	12	27	16	15	14	14	25	13
North Side Boulder	10	3	.....	.....	8	5	.....	10	3	8	9	6	3	6	5
Woodville	9	22	10	.....	4	37	.....	2	16	15	12	12	22	28	22
Elk Park	9	7	3	.....	7	12	.....	16	4	12	13	6	3	8	5
Cold Springs	10	4	3	.....	10	7	.....	12	5	11	9	8	5	7	9
Eva May	1	3	11	.....	1	14	.....	10	6	9	12	7	6	5	5
Basin	41	42	144	2	25	206	2	172	59	130	182	125	59	66	59
Welch Spur	5	3	2	.....	3	7	.....	7	4	7	4	7	4	3	2
Comet	2	4	.....	.....	.....	6	.....	3	3	3	3	1	5	3	3
Lockhart	3	2	.....	.....	4	.....	.....	4	1	4	4	3	1	1	2
Totals	501	525	229	36	408	861	33	726	602	721	667	534	517	584	568

JEFFERSON COUNTY—Continued.

PRECINCTS	Sheriff		Treas.		Clerk and Recorder		Assessor		Attorney		Supt. of Schools		Surv'r		Coroner		Pub. Adm'r	
	Manning, D.	Gibson, R.	Sweet, D.	Burdick, R.	Scharf, D.	Douglas, R.	Murphy, D.	Tindali, R.	Pace, D.	Stranahan, R.	Miller, D.	Kruger, R.	Cralle, D.	Redfield, R.	Less, D.	Denbow, R.	Thompson, D.	Benjamin, R.
Big Indian	9	5	4	9	5	9	7	7	4	10	2	13	5	9	5	8	5	8
Wickes	45	32	34	39	44	31	51	22	35	40	30	40	31	40	10	62	32	39
Claney	59	62	52	64	54	69	83	35	41	78	63	56	59	51	54	57	64	48
Corbin	35	7	24	18	27	14	33	7	14	27	8	33	12	26	7	35	19	22
Boulder	110	117	139	78	142	79	160	57	70	144	132	86	141	70	60	154	136	83
Gregory	11	3	7	5	10	4	12	3	7	8	6	8	13	2	6	8	10	4
Ten Mile	9	8	9	7	11	5	12	5	11	5	9	7	11	4	10	5	9	6
Mitchell	3	13	7	8	6	10	14	1	4	11	5	10	4	11	4	11	4	11
Bevansville	4	6	5	4	9	2	5	4	1	8	6	4	4	4	3	5	4	4
Meeking Bird	1	8	5	2	7	2	4	4	3	6	4	4	6	3	6	3	7	2
Jefferson	17	18	15	21	23	12	24	9	14	21	19	17	19	15	19	16	17	18
Lower Boulder	22	11	18	15	29	4	21	10	16	17	25	8	22	11	20	13	25	7
Elkhorn	22	26	19	36	10	10	27	19	21	26	17	30	25	21	22	21	21	25
Whitehall	102	149	35	217	108	126	129	101	180	71	123	115	82	147	205	39	102	124
Jefferson River	3	6	7	1	5	3	4	5	3	6	3	6	4	5	3	4	3	5
Bernice	....	17	7	9	9	8	5	12	1	16	3	14	8	9	4	13	4	12
Homestake	15	23	6	32	19	15	24	11	27	11	8	28	17	15	21	12	15	19
North Side Boulder	9	3	8	4	10	3	10	2	9	3	9	4	4	4	5	7	9	3
Woodville	11	33	19	23	23	20	25	15	11	30	18	23	17	23	17	23	17	22
Elk Park	9	10	13	5	13	7	12	5	3	16	9	11	11	6	8	10	11	8
Cold Springs	14	3	8	9	15	2	17	....	8	13	5	11	3	14	13	4	11	6
Eva May	7	8	12	2	10	5	13	2	3	13	5	11	9	7	5	10	5	10
Basin	130	109	139	68	170	50	162	60	96	124	115	112	155	58	130	82	141	70
Welch Spur	8	3	7	4	7	4	6	3	7	4	7	4	6	3	9	1	8	3
Comet	3	3	3	3	3	3	3	3	....	6	....	6	2	4	2	4	3	3
Lockhart	3	3	5	....	4	....	4	1	3	1	3	1	4	....	4	....	4	....
Totals	661	686	635	666	799	498	867	406	597	710	613	651	685	555	652	607	686	567

For the Amendment, 289.
Against the Amendment, 208.

LEWIS AND CLARKE COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress						Associate Justice			Representatives						
	Dixon, R.	Evans, D	Dee, L	Sproule, S	Goddard	Holloway, R.	Leslie, D	Cameron, S	Sullivan, D	Phelps, D	Donaldson, D	Urquhart, D	Flaherty, D	Muffly, D	Word, D	
First	80	69	37	9	.....	143	62	4	74	71	60	101	69	69	72	
Second	56	49	33	11	.....	110	46	5	59	59	54	88	52	49	50	
Third	52	32	12	9	.....	72	35	5	42	40	34	49	47	40	52	
Fourth	72	56	15	6	.....	104	49	2	53	57	44	59	77	57	71	
Fifth	88	70	13	5	1	126	55	4	56	73	48	64	74	70	88	
Sixth	39	28	20	7	.....	66	25	5	30	35	26	38	31	30	30	
Seventh	89	48	8	3	.....	108	41	.....	31	39	34	43	47	35	53	
Eighth	51	40	18	9	.....	82	36	6	37	44	32	47	39	40	46	
Ninth	40	21	9	10	1	64	21	5	29	27	27	28	30	27	29	
Tenth	99	67	13	6	.....	137	52	4	47	76	48	63	76	55	107	
Eleventh	52	62	18	21	.....	81	68	16	66	59	65	63	64	56	59	
Twelfth	51	41	10	11	.....	69	43	9	45	36	38	44	40	34	41	
Thirteenth	144	85	47	29	.....	204	89	15	71	75	63	83	88	97	97	
Fourteenth	118	78	25	21	.....	166	78	12	66	78	63	86	80	77	91	
Marysville 15	41	34	44	1	.....	96	39	2	60	30	26	33	31	23	35	
Marysville 16	28	24	41	.....	.....	70	28	.....	57	21	22	30	15	17	26	
Unionville and Park 17	14	6	1	3	.....	17	8	.....	11	7	10	15	12	10	11	
Mouth of Nelson 18	9	15	10	5	.....	19	15	6	15	13	10	16	15	17	15	
Rimini 19	19	11	15	1	.....	39	7	1	15	11	10	12	6	8	10	
Putler 20	14	14	5	1	.....	23	13	1	20	14	16	21	20	18	17	
Kesslers 21	41	32	26	7	.....	59	42	5	30	31	34	42	41	32	40	
Bald Butte 22	34	18	15	.....	.....	44	21	.....	39	19	25	29	19	19	19	
Empire and Glouster 23	9	6	1	1	.....	11	6	.....	4	4	7	11	6	5	10	
Silver 24	7	8	1	1	.....	9	10	1	8	12	7	11	9	12	11	
Jay Gould 25	5	2	3	.....	.....	8	3	.....	.....	1	1	1	.....	1	.....
Canyon Creek 26	14	6	1	1	.....	16	4	1	.....	8	8	9	.....	6	10	
Wilburns 27	2	6	2	1	.....	4	6	1	.....	7	5	7	.....	7	7	

LEWIS AND CLARKE COUNTY—Continued.

PRECINCTS	Congress			Associate Justice		Representatives									
	Dixon, R.	Evans, D.	Dee, L.	Sproule, S.	Goddard	Holloway, R.	Letlie, D.	Cameron, S.	Sullivan, D.	Phelps, D.	Donaldson, D.	Urquhart, D.	Flaherty, D.	Mully, D.	Word, D.
College Place 28	26	14	3	2	.....	35	14	2	14	15	16	19	17	16	16
Valley 29	13	21	1	1	.....	16	22	1	20	22	25	24	21	21	20
East Helena 30	104	59	70	7	.....	177	73	10	83	70	143	82	83	84	76
French Bar and Spokane 31	.....	10	.....	.....	.....	.....	11	.....	9	10	11	9	10	10	10
Mitchell 32	5	3	.....	2	.....	6	2	.....	2	3	5	3	3	4	4
Wolf Creek 33	18	15	.....	.....	.....	16	15	1	17	15	11	17	16	14	22
Craig 34	19	11	1	.....	.....	18	13	1	14	16	9	16	11	10	14
Dearborn 35	3	3	.....	.....	.....	3	3	.....	3	3	3	3	3	3	3
Hogan 36	6	6	.....	.....	.....	4	8	.....	6	8	5	6	8	7	10
Augusta 37	40	51	4	.....	.....	44	58	.....	57	63	42	49	54	50	71
Dearborn Canyon 38	3	.....	3	.....	.....	7	.....	.....	2	2	2	2	2	2	2
Rock Creek Basin 39	6	11	.....	.....	.....	6	11	.....	10	9	10	8	10	10	10
Middle Fork Dearborn 40	17	6	.....	.....	.....	16	9	.....	6	8	8	8	8	8	8
York 41	5	16	1	.....	.....	5	18	.....	17	17	17	18	15	17	18
Canyon Ferry 42	17	27	2	1	.....	24	25	.....	31	27	29	27	31	30	31
Lincoln 43	25	17	9	2	.....	46	16	1	14	11	18	27	22	28	28
Silver Camp 44	1	8	7	2	.....	10	7	1	12	6	11	11	9	9	10
Stemple 45	2	4	.....	.....	.....	2	4	.....	2	4	4	4	4	4	3
Nelson 46	6	9	3	3	.....	13	10	2	8	9	12	10	11	10	13
Hardseye 47	7	7	.....	3	.....	8	8	2	3	3	3	4	4	5	5
Copper Camp and Flesher 48	1	6	.....	.....	.....	1	8	.....	9	3	7	7	8	8	5
Totals	1,392	1,232	547	200	2	2,404	1,237	131	1,325	1,271	1,210	1,442	1,349	1,264	1,477

LEWIS AND CLARKE COUNTY—Continued.

PRECINCTS	Representatives							Sheriff			Clerk and Recorder			
	Rose, S.....	Newberry, S.....	Carlson, S.....	Lehman, S.....	Stickney, S.....	Rottler, S.....	Cock, S.....	O'Connell, D.....	Holbrook, R.....	Smith, L.....	Gold, S.....	Miller, D.....	Pickett, R.....	Tonghill, L.....
First	4	3	6	4	5	3	3	120	56	48	1	80	86	40
Second	3	1	3	6	3	4	1	82	56	32	1	61	63	24
Third	2	3	3	2	2	2	2	62	46	11	1	49	54	10
Fourth	1	3	4	2	1	1	2	89	55	16	1	67	70	16
Fifth	3	3	4	3	3	2	5	92	86	13	1	83	92	15
Sixth	3	5	9	5	5	5	4	45	32	24	3	40	35	22
Seventh	1	1	1	1	2	.....	1	71	70	15	.....	62	81	14
Eighth	8	7	6	7	5	6	4	58	54	18	4	54	55	17
Ninth	5	4	5	3	5	6	5	44	43	8	1	33	45	6
Tenth	6	5	3	4	6	5	4	88	95	16	.....	83	100	8
Eleventh	16	14	13	15	15	13	13	124	31	21	5	89	53	15
Twelfth	9	9	8	10	8	9	7	84	34	15	.....	62	49	13
Thirteenth	11	13	14	12	11	10	10	170	100	53	7	126	135	53
Fourteenth	10	14	13	14	13	8	7	133	96	36	3	101	125	32
Marysville 15.....	.....	1	1	1	1	.....	1	45	36	27	.....	42	27	31
Marysville 16.....	.....	.....	1	2	1	.....	.....	45	36	27	.....	42	37	31
Unionville and Park 17.....	.....	.....	.....	.....	.....	.....	.....	14	12	1	.....	12	15	.....
Mouth of Nelson 18....	6	5	5	5	6	5	4	19	9	11	3	18	14	10
Rimini 19.....	1	1	1	1	1	1	1	11	14	21	1	10	20	15
Butler 20	2	2	2	2	2	2	2	21	16	4	1	24	13	3
Kesslers 21	2	3	2	1	2	7	1	63	27	31	1	53	29	22
Bald Butte 22.....	.....	.....	.....	.....	.....	.....	.....	35	27	11	.....	34	29	5
Empire and Glouster 23.....	.....	.....	.....	.....	.....	.....	.....	6	8	3	.....	10	5	1
Silver 24.....	2	1	2	2	2	.....	.....	15	5	.....	.....	17	4	.....
Jay Gould 25.....	1	.....	1	1	1	1	1	2	4	.....	.....	7	3	1
Canyon Creek 26....	1	1	1	1	1	1	1	13	10	1	1	12	12	1
Wilburns 27.....	.....	.....	.....	.....	.....	.....	.....	8	1	2	1	7	2	2

LEWIS AND CLARKE COUNTY—Continued.

PRECINCTS	Representatives							Sheriff		Clerk and Recorder				
	Rose, S.....	Newberry, S	Carlson, S.....	Lehman, S.....	Stickney, S.....	Rottler, S	Cock, S.....	O'Connell, D.....	Holbrook, R.....	Smith, L.....	Gold, S.....	Miller, D	Pickett, R.....	Fonghill, L.
College Place 28	2	3	1	2	2	2	2	26	20	5	1	27	22	4
Valley 29.....	2	3	1	2	1	1	.....	27	14	3	.....	25	15	3
East Helena 30.....	6	6	7	7	8	7	6	120	102	57	4	94	109	62
French Bar and Spokane 31 .....	.....	.....	.....	.....	.....	.....	.....	9	2	.....	.....	10	1	.....
Mitchell 32.....	1	1	1	1	1	1	1	5	5	.....	1	5	3	.....
Wolf Creek 33	1	2	1	2	2	1	.....	25	9	.....	1	25	9	.....
Craig 34.....	1	1	1	1	2	1	2	29	9	.....	.....	18	16	.....
Dearborn 35 .....	.....	.....	.....	.....	.....	.....	.....	5	2	.....	.....	5	2	.....
Hogan 36 .....	.....	.....	.....	.....	.....	.....	.....	9	4	.....	.....	10	3	.....
Augusta 37	1	.....	.....	.....	.....	.....	.....	71	49	1	.....	74	41	1
Dearborn Canyon 38 .....	.....	.....	1	1	1	1	1	2	3	.....	2	6	1	.....
Rock Creek Basin 39 .....	.....	.....	.....	.....	.....	.....	.....	13	5	.....	.....	12	5	.....
Middle Fork Dearborn 40 .....	.....	.....	.....	.....	.....	.....	.....	10	16	.....	.....	9	17	.....
York 41.....	.....	.....	.....	.....	.....	.....	.....	19	5	.....	.....	19	4	1
Canyon Ferry 42.....	1	1	2	2	1	1	1	31	17	3	.....	36	14	1
Lincoln 43.....	.....	1	1	2	1	2	1	26	41	5	.....	39	23	3
Silver Camp 44.....	1	1	1	1	1	1	.....	18	3	1	.....	18	2	1
Stemple 45.....	.....	.....	.....	.....	.....	.....	.....	5	2	.....	.....	4	3	.....
Nelson 46	11	2	1	1	3	1	1	9	11	3	2	15	7	0
Birdseye 47.....	2	2	2	3	2	2	3	9	5	4	1	11	6	2
Copper Camp and Flesher 48 .....	.....	.....	.....	.....	.....	.....	.....	8	2	.....	.....	8	2	.....
Totals	127	121	129	129	127	112	94	2,039	1,399	580	51	1,767	1,565	495

LEWIS AND CLARKE COUNTY-Continued.

PRECINCTS	County Att'y		Assessor			Treasurer			Auditor		
	Working, R....	Penwell, D.....	Martien, D	Weiber, R.....	Ellingson, S.....	Settles, D.....	Reifenrath, R.....	Workman, L.....	Johnson, S.....	Sweeney, D.....	Garlow, R.....
First	125	80	97	86	12	89	74	36	2	99	83
Second	92	68	78	67	2	61	63	23	2	67	70
Third	64	49	62	46	2	82	46	10	3	50	53
Fourth	80	72	81	62	4	80	52	14	6	78	68
Fifth	102	86	90	92	2	41	92	12	2	84	89
Sixth	49	47	45	39	6	71	35	19	3	43	37
Seventh	105	49	72	76	3	64	72	13	1	51	91
Eighth	61	64	71	51	4	43	51	13	7	56	54
Ninth	53	34	47	33	3	93	35	8	4	43	46
Tenth	93	98	107	84	3	84	90	9	3	83	100
Eleventh	71	93	101	51	12	84	56	22	9	93	49
Twelfth	66	64	72	48	5	62	44	15	6	58	49
Thirteenth	199	110	151	147	10	130	135	45	11	118	148
Fourteenth	162	97	146	104	8	116	107	30	9	104	128
Marysville 15.....	75	65	67	65	2	51	42	45	1	55	37
Marysville 16.....	48	56	51	48	3	44	29	27	.....	38	26
Unionville and Park 17	15	11	14	13	.....	13	13	1	.....	15	10
Mouth of Nelson 18....	21	20	30	9	1	18	14	6	3	15	18
Rimini 19.....	34	13	16	25	3	8	21	18	1	7	20
Butler 20	25	16	23	13	2	19	16	4	1	22	15
Kesslers 21	52	64	78	36	3	42	43	26	3	56	33
Bald Butte 22.....	39	34	30	37	.....	26	33	8	.....	35	25
Empire and Glouster 23.....	14	4	9	8	.....	9	4	1	.....	7	8
Silver 24.....	6	14	17	3	.....	17	4	.....	.....	18	3
Jay Gould 25.....	4	7	19	2	.....	1	7	.....	1	3	6
Canyon Creek 26.....	12	12	13	10	1	9	13	1	1	12	11
Wilburns 27.....	2	9	8	2	2	7	2	2	1	8	2

LEWIS AND CLARKE COUNTY--Continued.

PRECINCTS	County Att'y		Assessor			Treasurer			Auditor				
	Working, R.....	Penwell, D.....	Martien, D.....	Weiber, R.....	Ellingson, S.....	Settles, D.....	Reifenrath, R.....	Workman, L.....	Johnson, S.....	Sweeney, D.....	Garlow, R.....	McCormick, L.....	Dyer, S.....
College Place 28	26	26	30	19	1	25	23	4	1	29	21	1	1
Valley 29.....	17	23	32	9	.....	27	13	2	.....	25	13	5	.....
East Helena 30.....	159	105	142	102	7	93	100	67	5	86	115	71	3
French Bar and Spokane 31	4	8	11	1	.....	11	1	.....	.....	11	1	.....	.....
Mitchell 32.....	4	5	5	4	.....	6	2	1	.....	5	4	.....	.....
Wolf Creek 33	11	24	29	7	.....	22	10	.....	1	23	11	.....	.....
Craig 34.....	10	26	25	9	1	15	19	.....	1	26	9	.....	.....
Dearborn 35	3	4	5	2	.....	5	2	.....	.....	5	2	.....	.....
Hogan 36	5	8	12	1	.....	10	3	.....	.....	12	1	.....	.....
Augusta 37	66	54	91	28	.....	67	49	.....	.....	74	38	.....	.....
Dearborn Canyon 38	5	2	4	3	.....	3	3	.....	1	2	3	.....	1
Rock Creek Basin 39	4	13	14	4	.....	12	5	.....	.....	12	5	.....	.....
Middle Fork Dearborn 40	18	8	10	16	.....	8	17	.....	.....	10	16	.....	.....
York 41.....	5	20	20	5	.....	21	4	1	.....	18	5	1	.....
Canyon Ferry 42.....	13	38	41	11	.....	37	13	1	.....	35	14	.....	.....
Lincoln 43.....	28	36	48	17	1	24	34	5	2	39	20	4	1
Silver Camp 44.....	9	13	22	.....	.....	12	7	2	1	19	.....	3	.....
Stemple 45.....	3	3	4	3	.....	4	2	.....	.....	3	3	.....	.....
Nelson 46	11	12	17	6	1	11	10	1	1	14	8	.....	2
Birdseye 47.....	12	7	12	6	1	6	10	1	2	9	9	.....	1
Copper Camp and Flesher 48	2	9	10	1	.....	7	2	.....	.....	9	1	.....	.....
Totals	2,084	1,780	2,169	1,511	105	1,768	1,522	495	91	1,784	1,578	460	90

LEWIS AND CLARKE COUNTY—Continued.

PRECINCTS	Public Administrator			Coroner			Supt. Schools			Surveyor			
	Schwab, R.....	Carlson, D.....	Hoffman, L.....	Yaeger, R.....	Brooke, D.....	Willett, S.....	Fullerton, R.....	Fortune, D.....	Murphy, L	Farmer, R	Bickett.....	Covington	Wade.....
First	79	72	42	87	91	13	121	59	27	116	.....	.....	.....
Second	56	57	38	62	66	16	77	55	26	92	.....	.....	.....
Third	54	41	15	54	51	6	79	26	9	78	.....	.....	.....
Fourth	80	52	15	68	72	7	90	56	5	97	.....	.....	.....
Fifth	94	65	18	111	71	2	117	61	10	142	.....	.....	.....
Sixth	33	34	23	42	37	8	51	28	19	49	.....	.....	.....
Seventh	86	48	16	78	62	8	109	33	11	121	.....	.....	.....
Eighth	56	42	16	64	46	10	75	43	7	78	.....	.....	.....
Ninth	42	34	12	44	41	4	51	33	7	57	.....	.....	.....
Tenth	91	76	19	107	77	8	111	75	9	145	.....	.....	.....
Eleventh	57	74	24	59	79	20	74	67	22	88	.....	.....	.....
Twelfth	46	52	20	50	56	12	61	56	9	74	1	.....	1
Thirteenth	128	105	76	160	100	21	200	74	36	220	.....	.....	.....
Fourteenth	119	103	31	117	107	21	167	68	24	189	.....	.....	.....
Marysville 15.....	39	36	47	47	54	7	59	19	67	86	.....	.....	.....
Marysville 16.....	28	26	38	34	43	6	31	10	62	50	.....	.....	.....
Unionville and Park 17	13	11	3	12	12	.....	23	4	.....	18	.....	.....	.....
Mouth of Nelson 18.....	14	13	15	12	22	6	22	15	5	26	.....	.....	.....
Rimini 19.....	15	9	20	23	9	3	16	16	13	34	.....	.....	.....
Butler 20	15	16	10	17	19	1	15	23	2	26	.....	.....	.....
Kesslers 21	26	50	35	47	50	11	62	32	19	74	.....	.....	.....
Bald Butte 22.....	29	25	9	32	27	1	43	14	12	40	.....	.....	.....
Empire and Gloucester 23.....	11	5	1	8	7	.....	6	2	9	11	.....	.....	.....
Silver 24.....	4	14	.....	6	10	1	6	7	5	10	.....	.....	.....
Jay Gould 25.....	3	6	2	4	4	3	8	2	1	10	.....	.....	.....
Canyon Creek 26.....	12	9	.....	13	10	1	20	3	2	18	.....	.....	.....
Wilburns 27.....	2	7	.....	2	9	1	1	1	9	4	.....	.....	.....

LEWIS AND CLARKE COUNTY—Continued.

PRECINCTS	Public Administrator			Coroner			Supt. Schools			Surveyor			
	Schwab, R.....	Carlson, D.....	Hoffman, L.....	Yaeger, R.....	Brooke, D.....	Willett, S.....	Fullerton, R.....	Fortune, D.....	Murphy, L.....	Farmer, R.....	Bickett.....	Covington.....	Wade.....
College Place 28	26	22	3	27	21	2	29	18	4	35	.....	.....	.....
Valley 29.....	12	22	5	11	25	3	22	20	1	20	.....	.....	.....
East Helena 30.....	105	84	72	117	104	13	128	70	74	148	.....	.....	.....
French Bar and Spokane 31	2	10	.....	1	10	.....	3	8	.....	3	.....	.....	.....
Mitchell 32.....	4	2	1	3	3	.....	8	3	.....	9	.....	.....	.....
Wolf Creek 33	11	20	1	12	19	2	15	18	1	23	.....	.....	.....
Craig 34.....	14	14	1	15	16	.....	25	8	1	29	.....	.....	.....
Dearborn 35	4	3	.....	4	3	.....	4	3	.....	6	.....	.....	.....
Hogan 36	3	8	.....	4	8	.....	8	5	.....	9	.....	.....	.....
Augusta 37	44	64	1	44	63	.....	68	46	.....	67	.....	.....	.....
Dearborn Canyon 38	3	3	.....	3	1	.....	4	1	2	5	.....	.....	.....
Rock Creek Basin 39	5	11	.....	8	8	.....	14	3	.....	14	.....	.....	.....
Middle Fork Dearborn 40	17	8	.....	17	8	.....	19	6	.....	20	.....	.....	.....
York 41.....	5	15	4	6	16	.....	4	21	1	7	.....	.....	.....
Canyon Ferry 42.....	16	29	1	16	28	.....	21	26	1	25	.....	.....	.....
Lincoln 43.....	25	18	14	30	25	.....	26	20	18	43	.....	.....	.....
Silver Camp 44.....	4	13	3	8	9	.....	5	4	9	14	.....	.....	.....
Stemple 45.....	1	4	.....	2	3	.....	1	2	3	5	.....	.....	.....
Nelson 46	6	13	2	10	11	.....	16	8	.....	11	.....	.....	.....
Birdseye 47.....	10	5	3	9	7	.....	10	5	4	13	.....	.....	.....
Copper Camp and Flesher 48	1	8	.....	6	4	.....	1	2	8	6	.....	.....	.....
Totals	1,550	1,458	658	1,713	1,624	238	2,126	1,179	554	2,645	1	2	1

For the Amendment, 773.
Against the Amendment, 397.

MADISON COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress				Associate Justice			Senator	Representatives							
	Total Vote Cast..	Dixon, R.....	Evans, D.....	Dee, F.....	Sproule, S.....	Holloway, R..	Leslie, D.....	Cameron, S...	Albright, R...	Stewart, D....	Linderman, R.	Teal, R.....	Miles, R.....	Tinsley, D....	Raymond, D..	Dullea, D.....
Virginia City	277	129	120	13	.....	158	102	.....	170	100	154	115	120	134	119	129
Adobetown	49	21	21	4	.....	27	21	.....	39	10	26	20	20	24	24	25
Summit	8	2	4	2	.....	5	3	.....	6	2	5	8	1	3	0	6
Ruby	67	29	32	.....	.....	30	32	.....	31	33	30	33	24	33	27	34
Alder	59	22	29	2	.....	25	27	.....	32	22	26	23	23	27	28	26
Laurin	82	35	44	1	.....	38	41	.....	39	43	39	31	37	43	37	40
Home Park	61	21	38	.....	.....	21	38	.....	27	34	24	21	29	38	38	26
Sheridan.....	308	171	83	25	2	197	95	5	206	89	235	130	162	84	125	91
Twin Bridges	179	113	51	9	2	137	37	2	126	46	120	99	91	52	47	87
Linder's School House	32	24	6	2	.....	25	6	.....	29	2	27	12	21	8	13	6
Rochester	233	101	49	.....	.....	184	34	.....	145	70	162	155	76	61	50	121
Silver Star	76	25	33	8	1	38	31	.....	28	40	28	27	26	31	30	46
Waterloo	52	25	24	2	.....	29	21	.....	21	28	28	22	22	26	28	20
Iron Rod.....	24	10	11	1	.....	13	7	.....	13	9	10	9	8	9	9	15
Pony	325	162	119	9	6	191	117	1	179	121	118	134	189	221	110	100
Norris	72	19	30	10	2	40	27	1	36	30	25	21	20	41	35	41
Revenue	42	14	11	16	.....	33	8	.....	26	16	17	19	16	19	18	21
Meadow Creek	61	31	22	1	.....	33	23	1	31	27	33	27	32	26	22	26
Ennis	106	49	49	.....	2	57	45	.....	53	52	45	50	49	56	54	51
Wigwam	21	12	8	.....	.....	12	7	.....	8	13	11	10	12	11	7	7
Monida	24	10	14	.....	.....	9	15	.....	10	14	10	9	9	14	14	14
Washington Bar	20	13	6	1	.....	15	5	.....	12	7	14	13	13	5	6	4
Power Canyon	14	8	6	.....	.....	10	4	.....	3	11	8	4	4	10	10	6
Lakeview	43	35	4	.....	1	14	22	2	37	3	36	34	32	5	7	6
South Boulder	70	48	18	.....	.....	49	15	.....	45	19	42	41	44	23	17	16
Parrot	43	17	11	8	1	29	12	1	17	20	15	10	15	25	18	19
Harrison	28	17	7	.....	.....	21	5	.....	15	12	16	16	17	11	7	6
Sand Creek	22	10	2	.....	.....	11	11	.....	11	11	8	14	7	16	6	12
Red Bluff	50	17	20	6	3	31	16	1	22	26	14	16	18	30	24	21
Cherry Creek	21	12	8	.....	.....	10	8	.....	14	6	10	11	11	9	7	9
Bear Creek	22	17	4	.....	.....	17	3	.....	16	5	15	17	17	6	3	3
Big Hole	6	1	1	3	.....	4	1	.....	2	3	1	1	1	4	4	4
Nobleville	8	3	4	.....	.....	2	4	1	4	4	3	3	4	5	6	3
Montana Mine	9	6	1	1	.....	8	0	1	7	2	6	4	2	4	5	5
Mammoth	21	9	2	8	.....	20	1	.....	14	5	7	9	10	12	8	4
Lyon	8	3	1	.....	.....	4	4	.....	3	5	3	4	4	6	2	4
Blacktail (Polls were not opened).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	2,543	1,241	904	189	27	1,547	848	19	1,477	940	1,381	1,172	1,187	1,132	955	1,076

MADISON COUNTY—Continued.

PRECINCTS	Clerk and Recorder		Treasurer		Sheriff		Assessor		Attorney		Supt. of Schools		Public Admin'r		Surveyor		Comer	
	Clem, R.....	Myers, D. ...	Gohn, R....	Haines, D....	Kadell, R.	Hill, D.	Stevenson, R.	Foreman, D.	Wedekind, R.	Duncan, D....	Baker, R.	Donegan, D..	Kellogg, R...	Peel, D.	Bushnell, R..	Potter, D.	Dwight, R.	Mahoney, D.
Virginia City	171	97	198	69	94	176	187	78	93	169	136	133	102	147	85	160	121	127
Adelotown	30	17	35	11	16	32	33	15	17	28	13	35	18	29	18	27	19	23
Summit	5	3	6	2	1	7	6	2	2	6	3	5	2	6	2	6	5	3
Ruby	33	32	41	25	23	42	40	23	20	42	32	33	27	36	25	35	28	32
Alder	26	29	31	23	20	35	39	15	21	31	30	25	22	31	22	31	22	30
Laurin	33	48	31	51	25	57	50	31	30	44	35	45	33	44	43	43	34	44
Home Park	26	35	24	39	18	42	44	15	18	42	18	42	22	28	20	39	20	38
Sheridan	245	55	189	109	113	191	242	57	160	119	154	144	166	106	169	99	161	100
Twin Bridges	123	52	109	67	107	68	107	71	118	56	133	44	117	53	122	49	122	49
Linder's School House	22	9	25	6	19	13	12	20	23	7	28	3	20	10	22	7	21	8
Recheater	129	75	111	98	164	61	128	78	107	95	136	82	111	86	116	81	128	70
Silver Star	32	35	25	45	28	42	26	43	31	35	24	47	28	35	28	35	30	38
Waterloo	25	27	26	26	24	27	24	27	24	27	33	19	25	26	24	24	26	25
Iron Rod	14	10	10	12	7	16	13	10	9	13	15	9	12	8	9	8	12	7
Pony	121	193	212	94	172	136	182	122	169	142	194	119	163	135	160	134	160	163
Norris	19	49	35	32	22	46	30	35	22	42	26	39	22	40	20	43	18	44
Revenue	16	23	21	20	14	27	21	20	20	22	14	25	12	28	14	26	16	24
Meadow Creek	31	28	37	20	23	36	24	35	23	36	27	31	29	28	27	31	30	26
Elm	53	50	65	38	43	62	55	48	59	54	47	56	48	53	49	53	49	54
Wigwam	14	6	13	8	15	4	16	5	12	6	12	8	13	7	11	9	9	11
Monida	9	15	10	14	8	16	11	13	10	14	11	13	10	14	10	14	10	14
Washington Bar	14	6	15	5	12	8	10	10	12	8	14	6	11	6	14	5	14	6
Power Canyon	4	10	10	4	3	11	3	11	2	12	4	10	5	9	6	8	5	9
Lakeview	35	7	33	9	33	9	36	5	32	8	35	7	35	5	37	4	36	4
South Boulder	42	23	46	19	48	18	50	17	50	17	54	12	49	16	47	18	47	16
Parrot	19	17	20	20	22	18	26	14	14	23	32	11	17	20	17	19	19	18
Harrison	14	13	22	5	19	9	19	8	22	5	20	7	20	6	20	8	20	6
Sand Creek	4	17	12	10	8	14	9	13	8	13	9	13	10	11	8	13	9	13
Red Bluff	13	29	18	26	7	39	14	33	10	34	23	26	9	31	14	25	25	22
Cherry Creek	12	7	12	8	11	9	7	13	11	9	10	10	13	6	10	9	12	6
Bear Creek	17	3	18	3	15	6	18	3	15	6	13	8	15	6	16	5	17	4
Big Hole	4	1	1	4	1	4	0	5	1	4	0	5	1	4	1	4	1	4
Nobleville	4	4	4	4	4	4	4	4	4	4	3	5	4	4	3	5	5	3
Montana Mine	8	1	5	3	5	4	8	1	3	6	7	2	7	1	6	2	5	3
Mammoth	7	12	12	8	12	7	13	7	13	6	12	9	10	8	12	8	11	9
Lyon	4	4	3	5	2	6	2	5	2	5	4	4	1	6	2	6	2	6
Blacktail (Polls were not opened).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	1,378	1,042	1,484	937	1,158	1,202	1,509	910	1,178	1,190	1,361	1,061	1,219	1,009	1,199	1,096	1,302	1,034

For the Amendment, 555. Against the Amendment, 266.

MEAGHER COUNTY—Continued.

PRECINCTS	Treasurer		Clk. & Rec'd'n		County Att'y		Assessor		Supt. Schools		Coro- ner		Public Adm'r		Sur- veyor	
	Gibson, R	Wallwork, D.	Harden, R.	Fowlie, D	Waterman, R.	Black, D.	Mayn, R.	Ray, D.	Welliver, R.	Baker, D.	Shorey, R.	Crosby, R.	Wiltse, D.	Godfrey, R.		
Rock Creek	10	4	11	2	11	2	8	5	7	6	10	8	4	10		
Shannon	8	7	7	9	7	9	5	10	6	10	9	5	11	8		
Port Logan	20	31	24	26	26	24	21	30	24	26	22	20	27	21		
White Sulphur Springs	180	108	155	128	178	114	122	164	157	130	195	105	171	162		
Sheep Creek	8	3	9	2	9	2	7	4	7	4	10	9	2	10		
Copper	19	22	27	15	25	18	16	25	20	25	26	20	19	22		
Battle Creek	11	8	10	9	11	7	6	13	5	13	11	7	11	12		
Dorsey	12	8	11	9	15	4	10	10	15	4	17	14	6	16		
Castle	14	25	10	31	13	28	4	36	20	22	17	10	26	19		
Comb Creek	11	7	6	12	14	4	15	3	13	5	17	15	3	15		
Martinsdale	27	28	27	30	21	33	15	41	17	38	30	21	39	30		
Two Dot	32	15	36	14	27	24	26	25	29	21	40	32	17	40		
Big Elk	2	8	7	3	5	5	.....	10	5	5	5	5	5	6		
Harlowton	28	24	26	23	18	36	24	30	32	19	39	35	15	39		
Winnecook	8	4	9	3	9	3	9	3	9	3	9	9	3	9		
Coka	3	5	6	2	7	1	7	1	7	1	7	7	1	7		
Totals	393	307	381	320	391	314	196	410	378	332	464	322	351	433		

For the Amendment, 252.
Against the Amendment, 68.

MISSOULA COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress				Asso. Justice		State Senator		Representatives													
	Evans, D.	Dixon, R	Sproule, S.	Dee, L.	Leslie, D.	Holloway, R, L, P	Cameron, S.	Joyce, D.	Donlan, R.	Hazelton, S.	Wilkinson, D.	Herzog, D.	Coffee, D.	Cyr, D.	Dwight, R.	Self, R.	Graham, R.	Owen, R.	Fabert, S.	East, S.	Smith, S.	Caulfield, S.
Missoula No. 1.	110	226	20	4	95	232	24	100	219	34	145	108	131	113	173	174	202	171	32	23	24	26
Missoula No. 2	84	176	14	4	69	181	16	83	168	22	110	73	99	86	132	117	150	122	30	24	26	25
Missoula No. 3.	157	314	25	2	140	300	26	158	290	33	207	146	217	142	250	219	248	226	32	28	28	30
Missoula No. 4.	98	314	29	7	101	284	35	110	285	44	138	125	132	111	217	195	259	227	51	39	39	48
De Smet No. 5.	13	21	4	.....	11	22	4	6	26	7	16	7	15	13	12	11	17	13	5	4	3	3
Arlee No. 6.	6	16	.....	.....	14	8	.....	7	13	.....	9	9	7	9	12	7	9	8	.....	.....	.....	.....
Vermillion No. 7.	9	11	.....	.....	7	11	1	8	11	.....	8	7	5	6	9	12	12	12	.....	.....	.....	.....
Quartz No. 8.	27	27	2	2	9	46	2	32	26	1	30	30	25	28	23	21	30	23	2	1	1	1
Bonita No. 9.	12	17	1	1	27	4	1	11	18	1	14	12	11	12	13	11	19	14	1	.....	.....	.....
Clinton No. 10.	12	31	.....	1	25	18	.....	12	30	.....	36	23	20	26	13	12	24	13	.....	.....	.....	.....
Carter No. 11.	10	6	4	.....	8	8	4	8	8	3	10	9	13	10	4	2	9	3	3	4	3	4
Carlton No. 12.	12	32	1	1	9	34	1	10	33	1	12	14	15	14	29	29	24	29	3	2	2	2
Cold Springs No. 13	13	40	.....	.....	15	33	1	20	32	1	24	14	26	16	25	26	24	30	1	1	1	1
Saltese No. 14.	22	16	1	1	1	46	.....	42	7	1	32	33	28	27	11	6	15	10	1	2	2	2
Bonner No. 15	15	117	5	1	101	37	4	23	113	6	46	59	43	40	77	55	86	75	7	8	10	9
Potomac No. 16	7	40	.....	.....	24	23	.....	15	34	.....	28	21	29	23	11	14	19	12	1	1	.....	.....
Superior No. 17	7	62	15	.....	17	41	16	21	42	12	29	22	29	27	24	24	38	24	14	11	7	11
Plains No. 18.	57	99	3	9	99	62	3	68	92	7	94	66	92	78	58	83	61	59	7	8	5	6
Thompson No. 19	35	81	2	1	76	34	3	46	69	4	57	48	44	37	57	54	62	67	3	4	3	4
Frenchtown No. 20	31	64	2	.....	36	56	2	10	88	2	44	44	43	48	42	35	42	36	3	2	3	2
Grass Valley No. 21.	3	13	.....	.....	3	11	.....	1	15	.....	4	3	3	11	10	10	10	10	5	.....	.....	.....
Heron No. 22.	23	10	.....	2	22	13	.....	26	9	.....	25	22	21	22	9	11	13	13	.....	.....	.....	.....
Lo Lo No. 23.	11	21	1	2	13	19	3	11	18	5	15	11	15	10	14	16	11	16	6	5	5	5
Stark No. 24	1	8	9	.....	1	9	8	5	4	9	.....	.....	3	4	3	2	6	1	16	9	10	11
St. Regis No. 25	9	19	22	.....	26	5	18	6	20	24	10	7	8	6	16	12	18	13	23	28	22	22
Trout Creek No. 26	2	4	.....	.....	2	2	3	1	2	3	1	2	2	2	3	3	3	3	.....	.....	.....	.....
De Borgia No. 27	8	35	12	2	13	31	13	6	43	9	12	7	14	12	23	28	33	30	20	14	13	13
Nine Mile No. 28	1	32	12	2	4	23	9	2	36	9	6	3	3	4	26	21	37	27	18	10	6	8
Martina No. 29	3	1	3	.....	2	.....	4	2	.....	5	2	2	2	2	.....	.....	.....	.....	5	4	4	4
Woodman No. 30	5	16	.....	.....	5	15	.....	1	20	.....	13	5	8	9	10	10	10	7	.....	.....	.....	.....
Lothrop No. 31.	19	72	33	.....	48	38	29	25	80	21	30	26	21	22	51	44	75	50	35	28	21	27
Huson No. 32	8	17	6	.....	19	7	5	12	17	4	16	13	14	14	5	5	9	5	11	7	5	8
Forest No. 33.	6	2	.....	.....	4	3	1	2	3	2	4	3	2	2	2	2	2	3	2	2	1	1
Total	836	1,960	226	42	1,046	1,667	234	801	1,872	268	1,229	970	1,140	985	1,364	1,271	1,580	1,346	332	269	244	273

MISSOULA COUNTY—Continued.

PRECINCTS	Sheriff		Treasurer		Clerk and Recorder		Assessor		Attorney				
	Thompson, R.	Fuller, S.	Heyfron, D.	Johnson, R.	Buscher, S.	Higgins, D.	Pringle, R.	Burk, S.	Massey, D.	Wagnitz, R.	Starr, S.	Hall, D.	Murphy, R.
Missoula No. 1.	167	20	187	138	27	149	177	24	125	210	20	156	183
Missoula No. 2.	110	14	134	116	23	106	143	19	98	155	17	19	157
Missoula No. 3.	221	28	220	243	30	228	230	28	161	282	26	251	223
Missoula No. 4.	172	37	189	200	47	134	267	32	134	272	32	160	273
De Smet No. 5.	15	4	18	15	4	17	15	4	16	15	4	14	19
Arlee No. 6.	11	.....	8	10	.....	10	11	.....	8	10	.....	5	16
Vermilion No. 7.	9	.....	8	12	.....	8	11	.....	16	4	.....	8	10
Quartz No. 8.	45	1	40	14	1	29	26	1	34	19	1	34	27
Benita No. 9.	20	.....	20	8	1	14	12	2	15	12	1	15	15
Clinton No. 10.	25	.....	38	6	.....	31	13	.....	30	12	.....	33	11
Carter No. 11.	13	3	13	3	3	9	4	5	13	2	4	15	2
Carlton No. 12.	22	1	27	19	1	16	30	1	14	30	2	28	19
Cold Springs No. 13.	25	1	30	19	1	25	24	1	26	23	2	28	25
Salese No. 14.	24	1	25	21	1	23	16	2	33	9	1	40	8
Bonner No. 15.	61	4	53	79	5	54	77	6	50	78	5	90	51
Potomac No. 16.	17	1	36	12	1	32	11	.....	37	8	.....	26	23
Superior No. 17.	54	3	33	26	11	27	32	10	45	19	8	27	52
Plains No. 18.	91	2	99	66	2	83	81	3	126	43	4	99	72
Thompson No. 19.	77	2	56	57	2	53	62	2	108	10	.....	71	41
Frenchtown No. 20.	39	1	60	33	3	57	36	3	57	36	2	41	56
Grass Valley No. 21.	3	.....	3	13	.....	6	10	.....	5	11	.....	2	14
Heron No. 22.	32	5	26	10	.....	21	14	.....	32	5	.....	27	10
Lo Lo No. 23.	23	9	16	15	3	13	17	4	16	13	3	12	21
Stark No. 24.	4	7	7	2	9	6	1	11	5	4	9	9	3
St. Regis No. 25.	10	18	13	12	23	8	17	22	20	10	18	16	21
Trout Creek No. 26.	4	1	4	2	.....	5	1	.....	6	.....	.....	4	2
De Borgia No. 27.	15	10	23	25	9	12	30	13	24	17	12	24	31
Nine Mile No. 28.	5	7	21	15	11	8	24	16	17	21	8	22	21
Martina No. 29.	4	2	1	1	5	2	.....	5	2	.....	5	6	.....
Woodman No. 30.	12	9	11	9	.....	6	14	.....	5	14	.....	14	7
Lothrop No. 31.	31	.....	41	47	30	27	48	40	23	60	34	65	45
Huson No. 32.	12	5	19	6	7	13	7	9	19	4	6	23	6
Forest No. 33.	6	.....	3	2	1	3	2	1	3	2	1	1	4
Totals	1,379	200	1,482	1,256	261	1,238	1,463	261	1,323	1,110	225	1,474	1,467

MISSOULA COUNTY—Continued.

PRECINCTS	Supt. of Schools		Coroner			Public Administrator		Surveyor		Auditor				
	Shelley, D	Spurgin, R.	Lucy, D.	Pixley, R.	Dingley, S.	Fischer, S.	Nesmith, D.	Moody, R.	Kitching, S.	Naughton, D.	Catlin, R.	Flynn, D.	Coleman, R.	Latulippe, S.
Missoula No. 1.	188	145	130	174	.....	38	125	176	32	.....	245	141	173	26
Missoula No. 2.	144	125	118	113	.....	35	91	137	26	1	189	116	134	15
Missoula No. 3.	225	235	189	231	.....	45	180	220	40	.....	348	172	249	24
Missoula No. 4.	186	224	181	189	.....	49	125	226	45	.....	313	189	200	33
De Smet No. 5.	20	14	17	14	.....	4	14	14	4	.....	26	22	10	4
Arlee No. 6.	18	5	8	10	.....	.....	6	12	.....	.....	14	8	10	.....
Vermillion No. 7.	13	6	8	10	.....	.....	6	12	.....	.....	16	2	18	.....
Quartz No. 8.	43	15	41	14	.....	1	28	21	2	.....	27	23	25	1
Bonita No. 9.	20	9	16	14	.....	1	14	13	2	.....	18	14	14	1
Clinton No. 10.	30	13	31	12	.....	.....	25	16	.....	.....	33	14	30	.....
Carter No. 11.	11	5	12	2	.....	5	10	4	4	.....	11	11	4	4
Carlton No. 12.	22	23	16	25	.....	2	14	26	3	.....	31	17	25	.....
Cold Springs No. 13.	24	29	20	28	.....	1	18	23	3	.....	40	25	24	1
Saltese No. 14.	41	7	30	12	.....	1	31	8	2	.....	17	32	10	5
Bonner No. 15.	82	57	75	53	.....	4	41	77	7	.....	111	49	74	5
Potomac No. 16.	29	21	29	11	.....	1	22	15	1	.....	30	21	17	1
Superior No. 17.	46	26	39	21	.....	9	18	31	14	.....	46	35	23	8
Plains No. 18.	87	86	99	62	.....	.....	81	74	.....	.....	106	52	108	.....
Thompson No. 19.	61	58	52	56	.....	2	51	56	1	.....	79	7	115	.....
Frenchtown No. 20.	58	38	57	35	.....	3	47	40	3	.....	51	55	36	3
Grass Valley No. 21.	5	11	5	11	.....	.....	5	11	.....	.....	15	6	10	.....
Heron No. 22.	20	15	21	12	1	.....	22	14	.....	.....	18	13	21	.....
Lo Lo No. 23.	15	18	12	18	.....	3	12	17	4	.....	21	18	13	2
Stark No. 24.	9	4	3	4	.....	10	3	3	11	.....	8	7	21	10
St. Regis No. 25.	19	19	13	15	.....	20	8	18	22	.....	25	11	15	22
Trout Creek No. 26.	5	1	4	2	.....	.....	2	3	1	.....	4	1	5	.....
De Borgia No. 27.	24	31	15	29	.....	13	16	25	15	.....	37	18	20	20
Nine Mile No. 28.	26	20	12	22	.....	11	7	22	11	.....	35	13	20	8
Martina No. 29.	7	.....	2	.....	.....	5	2	..	4	.....	3	2	.....	4
Woodman No. 30.	11	8	6	14	.....	.....	8	11	.....	.....	19	9	11	.....
Lothrop No. 31.	64	62	36	47	.....	30	23	52	34	.....	78	32	49	32
Huson No. 32.	27	3	18	4	.....	8	12	6	9	.....	14	20	5	6
Forest No. 33.	4	2	4	2	.....	.....	3	2	1	.....	3	1	21	3
Totals	1,584	1,325	1,319	1,264	1	301	1,070	1,385	301	1	2,031	1,161	1,472	238

For the Amendment, 788.

Against the Amendment, 392.

PARK COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress				Associate Justice			Representatives					House		Sheriff			
	Dixon, R.	Evans, D.	Sproule, S.	Dee, L.	Holloway, R.	Leslie, D.	Cameron, S.	Hefferlin, R.	Pettigrew, R.	Swindlehurst, D.	Myers, D.	Mabie, S.	Dick, S.	Chambers, R.	McCue, D.	Graham, S.	Robertson, R.	Baley, D.
Livingston No. 1....	125	78	41	.....	135	73	39	100	67	108	86	41	27	83	134	51	93	125
Livingston No. 2....	153	86	11	4	165	87	12	136	91	119	102	13	10	100	163	12	152	98
Livingston No. 3....	92	73	24	4	106	65	18	75	47	96	81	24	17	68	105	29	91	82
Cokedale	9	3	.....	.....	10	3	.....	6	4	7	7	.....	.....	6	6	.....	11	2
Fridley	22	16	3	.....	21	14	5	19	13	19	8	6	3	24	15	2	21	21
Tom Miner Basin ..	10	11	2	.....	13	10	1	7	5	13	11	3	2	6	18	2	5	19
Horr	36	21	2	.....	37	23	3	34	26	16	24	3	5	34	24	3	30	19
Aldridge	48	13	38	.....	46	13	42	26	25	19	14	28	62	42	26	30	49	38
Gardiner	31	19	1	.....	36	20	.....	19	34	21	26	1	1	25	33	.....	44	18
Cinnabar	8	10	1	.....	11	8	1	5	5	9	12	1	1	13	13	1	6	14
Cooke	10	12	1	.....	14	11	.....	10	11	9	11	.....	1	13	13	.....	18	9
Jardine	71	34	22	1	79	35	21	61	61	35	36	24	20	69	48	20	63	69
Chico	20	16	18	1	21	17	20	18	15	12	19	28	16	22	20	16	22	26
South Cascade ..	14	4	1	.....	12	5	1	6	6	11	6	2	.....	10	5	.....	9	9
Richland	7	16	5	.....	8	15	5	5	5	20	13	6	4	3	24	4	4	16
Trail Creek	17	13	4	.....	17	16	4	11	7	22	18	1	3	12	19	2	19	18
Lower Mission ..	7	2	.....	.....	19	2	.....	8	6	5	2	1	.....	9	4	.....	10	3
Upper Mission ..	17	2	3	.....	17	2	3	16	13	2	3	3	1	14	2	3	12	9
West Boulder ..	10	2	.....	.....	11	3	1	10	7	3	3	2	2	13	2	1	14	2
Contact	6	1	.....	.....	5	.....	.....	5	6	1	2	.....	.....	6	1	.....	5	2
Hunter's Hot Sprgs	15	10	2	.....	13	11	1	10	11	14	15	1	1	15	12	1	13	14
Shields River	69	41	2	2	86	26	2	52	48	55	72	3	3	48	72	2	68	60
Cottonwood	12	10	.....	.....	12	10	1	8	12	11	14	.....	.....	12	11	1	14	10
Myersburg	11	11	1	1	12	11	.....	8	7	13	14	.....	.....	11	13	.....	11	11
Murphy's	10	8	.....	.....	11	6	.....	6	3	9	13	.....	.....	10	9	.....	11	6
Muir	1	1	.....	.....	1	1	.....	1	1	1	1	.....	.....	2	.....	.....	1	1
Lat.....	6	2	1	.....	6	2	1	6	3	4	2	1	1	7	.....	.....	10	3
North Cascade ..	22	8	.....	.....	20	8	.....	17	13	12	7	3	.....	10	18	3	20	8
Totals	859	523	153	14	935	499	181	685	552	666	624	195	180	685	818	184	825	702

PARK COUNTY—Continued.

PRECINCTS	Assessor			Clerk and Recorder			Att'y	Supt. Schools			Sur- veyor	Coro- ner	Pub. Adm'r	
	Sheriff	Daniels, R.....	Proffitt, D.....	Beever, S.....	Angus, R.....	Mitchell, D.		Baker, S.....	Glenn, R.....	Colvin, D.....					Crookes, R.....	Leard, R.....	Krohne, R.....	Cameron, D.....
Livingston No. 1.....	65	83	163	26	122	114	30	143	173	150	153	113	110	
Livingston No. 2.....	28	105	150	14	154	101	10	181	147	182	182	113	10	
Livingston No. 3.....	34	62	114	21	102	76	21	120	140	125	118	83	8	
Cokedale .....	..	5	8	..	9	4	..	10	11	10	12	11	2
Fridley	3	31	12	2	33	7	2	31	25	33	32	27	14	
Tom Miner Basin	2	11	10	5	15	9	1	13	12	16	17	12	10	
Horr	5	32	23	6	30	28	3	43	40	23	41	40	22	
Aldridge	26	18	41	50	30	56	18	52	21	61	60	34	25	
Gardiner .....	..	37	17	..	37	23	..	27	24	37	33	27	17
Cinnabar	3	17	4	2	10	9	1	10	6	11	10	8	6	
Cooke .....	..	17	7	..	14	13	..	13	17	9	12	11	10
Jardine	16	80	44	14	67	53	15	92	46	99	95	77	38	
Chico	15	25	20	16	27	16	15	30	27	32	34	24	15	
South Cascade	1	15	4	1	13	4	2	18	7	14	15	9	7	
Richland	9	7	18	7	11	16	4	11	25	14	9	12	15	
Trail Creek	2	23	15	2	15	20	1	23	17	24	22	18	15	
Lower Mission .....	..	7	5	..	8	3	1	10	4	7	7	9	2
Upper Mission	1	19	3	..	15	5	2	18	10	14	16	13	6	
West Boulder	1	10	3	3	13	2	1	14	9	14	14	12	2	
Contact .....	..	7	..	..	6	1	..	6	7	6	6	3	4
Hunter's Hot Springs	2	16	9	2	17	4	6	17	18	18	17	8	14	
Shields River	4	55	61	4	77	33	3	81	72	85	78	55	49	
Cottonwood .....	..	10	10	4	13	10	..	14	13	13	14	10	11
Myersburg	2	15	9	1	*13	11	..	15	7	17	14	14	9	
Murphy's	3	10	10	..	18	3	..	17	10	18	16	13	5	
Muir .....	..	1	1	..	2	..	..	2	1	2	1	2	..
Lat.....	1	4	9	1	5	7	1	9	4	9	7	7	3	
North Cascade	4	24	5	3	22	9	..	25	13	23	25	21	8	
Totals	227	746	775	184	898	637	187	1,055	927	1,093	1,059	822	615	

For the Amendment, 265.

Against the amendment, 234.

POWELL COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress			Associate Justice		Senator		Representative		Sheriff		Clerk & Recorder		Treasurer		Assessor			
	Evans, D.....	Dixon, R.....	Sproule, S.....	Dee, L.....	Leslie, D.....	Holloway, R.....	Cameron, S.	Scharnikow, D...	Kohrs, R.....	Geary, D.....	Faust, R.....	McMahon, D....	Barnden, R.....	Hoss, D.....	Evans, R.....	Gleeson, D.....	Peck, R.....	Shaw, D.....	Tibbetts, R.....
1. Avon	15	44	1	3	12	52	1	27	39	16	50	13	58	15	50	12	53	11	59
2. Blossburg	5	4	.....	3	5	6	.....	5	5	7	7	4	4	7	3	7	4	9	1
3. Colema	3	13	.....	3	2	14	.....	1	15	4	11	11	4	1	14	7	8	4	12
4. Danielsville	5	17	1	40	3	63	1	7	58	24	20	46	17	21	31	26	31	20	30
5. Deer Lodge, North	52	55	.....	6	38	75	.....	55	64	40	61	57	58	55	59	45	71	39	78
6. Deer Lodge, South	107	113	1	2	78	134	1	98	130	103	112	135	96	115	114	120	105	103	120
7. Elliston	35	83	4	2	27	91	5	47	84	41	86	47	87	46	84	41	83	44	84
8. Emery	12	15	.....	9	9	24	.....	21	14	19	16	21	15	15	19	17	18	13	21
9. Garrison	13	17	.....	1	15	17	.....	17	14	13	16	16	16	16	15	15	15	19	13
10. Gold Creek	10	14	.....	4	9	22	.....	10	23	18	13	11	21	3	31	22	11	20	10
11. Helmville	60	45	.....	2	37	70	.....	58	54	86	32	73	43	44	68	55	54	88	29
12. Ontario	5	6	.....	2	7	7	.....	7	6	6	6	6	6	9	5	9	5	5	9
13. Ophir	21	16	.....	3	22	20	.....	26	15	21	20	20	21	19	21	23	17	18	24
14. Ovando	10	53	1	1	9	55	1	15	50	9	57	23	42	12	51	10	57	26	42
15. Pioneer	40	18	.....	2	38	24	.....	30	38	35	20	29	33	25	41	32	30	41	21
16. Race Track	21	35	.....	6	8	49	.....	21	37	26	32	28	31	29	28	24	34	23	32
17. Salmon Lake	5	12	3	.....	17	2	1	4	11	4	17	11	8	5	13	10	5	15	5
18. Sunset	11	5	.....	.....	11	3	.....	13	2	12	4	16	1	10	5	15	.....	16	.....
19. Washington Gulch	20	17	2	2	16	25	1	28	13	20	21	15	25	11	31	16	25	11	31
20. Woodworth	6	14	1	.....	5	16	.....	9	13	6	16	7	15	8	12	6	16	7	16
21. Clearwater	2	11	.....	.....	2	9	.....	2	8	1	10	4	6	2	9	8	5	7	5
Totals	458	607	14	88	370	778	11	501	693	524	624	601	609	468	704	520	647	539	642

POWELL COUNTY—Continued.

PRECINCTS	Commissioners										Attorney		Public Adm'r		Clerk of Court		Coroner		Surveyor	
	Supt. of Schools																			
		Wiles, D.....	Galbraith, R.....	Cockrell, D.....	Thompson, D....	Manning, D.....	Zenor, R.....	Mannix, R.....	Kuehn, R.....	Rhoades, D.....	Howard, R.....	Emerson, Ind....	Kau, D.	Dunnigan, R....	Kelley, D.....	Dyer, R.....	Hufty, D.....	Smith, R.....	McLain, D.....	Fisher, R.....
1. Avon	45	22	28	20	17	46	41	42	11	28	23	14	43	34	29	36	30	20	43	
2. Blossburg	10	1	6	8	6	4	3	3	4	6	....	6	6	4	6	8	2	8	2	
3. Coloma	11	5	2	3	7	13	12	7	2	12	12	2	2	14	6	9	12	1	15	
4. Danielsville	56	9	25	20	16	29	16	18	15	14	19	18	25	27	25	20	24	19	27	
5. Deer Lodge, North	90	27	73	40	41	78	55	42	30	24	58	54	50	80	32	39	69	65	44	
6. Deer Lodge, South	183	45	152	80	87	123	112	98	75	50	98	113	88	170	51	98	112	144	73	
7. Elliston	69	63	33	62	28	79	60	85	38	60	35	36	82	56	71	46	77	33	83	
8. Emery	35	1	21	14	12	24	16	14	10	7	16	12	17	26	7	12	20	10	22	
9. Garrison	26	6	21	14	12	16	10	14	8	14	9	13	17	20	12	11	21	15	15	
10. Gold Creek	28	6	21	13	14	14	14	12	6	8	16	10	20	17	12	10	20	9	21	
11. Helmville	72	46	44	50	58	45	94	33	40	39	25	46	51	52	64	60	44	45	54	
12. Ontario	8	6	7	3	7	8	2	8	3	2	7	8	6	8	6	7	6	7	6	
13. Ophir	31	11	17	33	30	24	8	5	17	6	17	21	16	33	8	31	10	25	16	
14. Ovando	34	31	24	9	34	48	45	30	18	39	7	16	46	33	32	11	55	12	64	
15. Pioneer	57	7	46	40	37	13	12	19	31	11	16	43	12	43	9	32	17	28	23	
16. Race Track	39	20	38	17	21	33	27	25	20	22	14	16	38	29	27	16	38	14	38	
17. Salmon Lake	8	8	7	6	14	9	10	5	7	10	....	5	11	8	10	7	8	7	10	
18. Sunset	11	4	5	5	9	9	9	5	8	7	....	9	4	14	....	10	3	8	6	
19. Washington Gulch	34	8	21	25	20	32	15	8	14	4	23	18	20	26	15	25	15	15	22	
20. Woodworth	14	9	7	5	12	12	10	12	10	12	....	6	15	13	10	7	14	6	14	
21. Clearwater	6	6	1	2	4	8	5	5	1	9	....	1	9	2	9	1	9	3	9	
Totals	867	341	599	469	486	667	576	40	338	384	385	467	588	703	442	490	606	494	597	

For the Amendment, 369. Against the Amendment, 235.

RAVALLI COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress						Associate Justice			State Senator		
	Dixon, R	Evans, D	Dee, L	Sproule, S	Holloway, R	Leslie, D	Cameron, S	Smart	Johnson	Man		
Sula	19	2	2	1	21	2		18	5		1	
Overwhich	18	10		5	18	10		20	10		4	
Darby	82	39	4	19	106	35	12	78	69		10	
Grantsdale	59	60	12	4	97	43	1	55	87			
Hamilton No. 1	118	85	9	21	94	141	13	126	111		16	
Hamilton No. 2	126	86	8	36	125	108	30	104	131		31	
Corvallis	136	89	5	5	155	79	4	113	123		4	
Victor	127	89	6	7	120	109	8	101	143		6	
Stevensville	210	159	12	8	243	140	4	151	223		7	
Eight Mile	13	7		3	17	6	2	10	8		3	
Florence	48	33	2	3	67	22	1	37	51		3	
Totals	956	639	60	107	1,061	695	79	813	961		74	

PRECINCTS	Representatives						Sheriff	Hk. & Rec'den	Treasurer	Assessor	Atty
	Conner	Lancaster	See	Faulds	Gibford	Kyle					
Sula	17	10	6	7	1	1					
Overwhich	8	10	19	11	6	8					
Darby	83	59	48	47	16	15					
Grantsdale	51	50	84	62	1	1					
Hamilton No. 1	104	97	112	92	17	13					
Hamilton No. 2	96	93	110	109	35	31					
Corvallis	116	107	104	95	5	2					
Victor	109	94	92	116	7	7					
Stevensville	172	214	136	202	5	3					
Eight Mile	14	15	6	7	3	2					
Florence	40	45	34	3	51	3					
Totals	807	788	751	782	99	86					

RAVALLI COUNTY—Continued.

PRECINCTS	County Commissioners									
	Supt. Schools	Surveyor	Pub. Adm'r	Coroner	Overturk	Holt	Gleason	Treece	Grover	Satterlee
Sula	19	4	15	12	20	14	6	1	6	10
Overwhich	19	14	9	17	8	4	2	6	6	32
Darby	83	74	58	89	112	43	20	13	27	118
Grantsdale	69	74	38	71	55	85	50	57	52	77
Hamilton No. 1	140	113	88	141	91	111	99	96	128	125
Hamilton No. 2	135	133	95	159	110	112	101	100	163	137
Corvallis	131	112	92	136	102	110	87	124	138	101
Victor	125	124	107	131	110	103	111	112	96	92
Stevensville	217	169	241	219	173	162	217	233	157	137
Eight Mile	15	10	16	15	8	9	24	5	12	3
Florence	50	39	48	49	32	30	56	42	33	32
Totals	1,003	866	807	1,039	827	783	773	794	821	861

For the Amendment, 415.

Against the Amendment, 356.

ROSEBUD COUNTY—ELECTION RETURNS—Continue.

PRECINCTS	Congress			Associate Justice		Senator	Representative		Sheriff	Cl'k of Court					
	Evans, D.....	Dixon, R.....	Sproule, S.....	Dee, L.....	Leslie, D.....	Holloway, R.....	Cameron, S.....	Hopkins, D.....	Wilson, R.....	Blair, D.....	Bray, R.....	Guy, D.....	Northway, R....	Pond, D.....	Muri, R.....
Terrett's	6	10	.....	.....	7	9	.....	9	9	7	9	10	8	10	8
McKay	6	11	.....	1	5	14	.....	8	11	5	14	5	14	8	11
Rosebud	8	47	.....	.....	8	50	.....	19	36	7	51	18	37	16	40
Ashland	4	6	.....	.....	4	6	.....	5	4	4	6	4	7	5	5
Lee	9	8	.....	.....	10	9	.....	11	9	10	9	9	11	12	8
Sabra	16	21	.....	.....	13	25	.....	20	20	12	27	15	24	16	23
Hathaway	7	12	.....	.....	7	12	.....	6	11	8	11	6	12	7	12
Forsyth	123	146	5	6	121	166	4	177	116	168	134	145	148	135	151
Rancher	11	14	.....	.....	10	15	.....	13	13	11	13	20	6	9	16
Armalls	6	3	.....	.....	6	3	.....	6	3	6	3	6	3	6	3
Antelope	1	4	.....	.....	1	4	.....	2	3	1	4	1	4	1	4
Birney	20	15	.....	.....	21	16	.....	22	14	21	16	24	13	20	17
Kirby	22	6	.....	.....	28	7	.....	26	8	25	7	28	6	25	8
Decker	9	7	.....	1	8	8	.....	7	8	9	7	9	7	9	7
Totals	248	310	5	8	249	344	4	342	265	294	311	300	300	279	313

ROSEBUD COUNTY—Continued.

PRECINCTS	Treasurer		Clerk & Rec'dr		Assessor		Att'y		Supt of Schools		Coroner		Public Adm'r		Commissioners					
	Longley, D. . . .	Bentall, R.	Bailey, D.	McRae, R.	Roney, D.	Grierson, R.	Dierks, D.	Gibson, R.	Higgins, D.	Lane, R.	Finch, D.	Kline, R.	Adams, D.	Snook, R.	Humphrey, D.	Alexander, D.	Mouart, D.	Schlitz, R.	Philbrick, R.	Hope, R.
Terrett's	12	6	13	5	12	6	10	8	13	4	9	8	9	7	12	12	7	7	9	9
McKay	9	10	9	10	8	11	7	12	8	11	8	10	6	12	8	6	4	12	13	13
Rosebud	23	34	9	49	11	46	11	46	16	39	14	42	13	43	8	16	10	49	40	42
Ashland	6	4	5	6	6	5	4	6	7	4	4	6	4	6	4	7	4	6	5	5
Lee	12	7	13	7	14	6	13	7	15	5	10	9	8	7	8	10	10	7	8	6
Sabra	21	19	14	25	13	27	14	25	15	23	18	22	14	26	11	16	11	23	24	18
Hathaway	6	13	5	14	6	13	6	13	7	11	7	9	7	10	6	6	5	13	9	9
Forsyth	163	125	163	122	122	165	146	142	148	142	144	139	138	145	140	164	148	113	120	120
Rancher	15	10	10	16	3	23	15	11	16	10	12	13	10	16	11	12	20	13	12	6
Armalls	6	3	6	3	6	3	6	3	5	4	6	2	6	3	6	6	2	2	2	2
Antelope	1	4	3	2	2	3	1	4	2	3	1	4	1	4	1	1	4	4	4	4
Birney	23	14	20	16	35	1	21	14	26	10	19	15	22	12	33	27	13	5	9	25
Kirby	26	7	27	5	29	5	27	7	31	3	26	7	26	6	26	27	23	4	4	6
Decker	9	8	7	9	8	9	7	9	14	3	8	7	9	7	10	8	4	5	6	11
Totals	332	264	304	289	275	323	288	307	323	272	296	303	272	304	286	323	265	296	256	276

For the Amendment, 131. Against the Amendment, 65.

SILVER BOW COUNTY - ELECTION RETURNS Continued.

Precinct No.	Congress			Asso Justice		Judge 2d Jud. Dist.		State Senator		Fusion Representatives																	
	Dee, L.	Evans, D.	Dixon, R.	Sproule, S.	Holloway, R.	Leslie, D.	Cameron, S.	McClernan, A. T. D.*	Noon, D.	Shropshire, R.	Tewey, A. T. D.* and F.	Gilchrist, D.	Gillis, R.	Smith, S.	Mullins, A. T. D.* and F.	Lynch, A. T. D.* and F.	Maginnis, A. T. D.*	Farmer, A. T. D.* and F.	Stapleton, A. T. D.* and F.	Lieneman, A. T. D.* and F.	Axtell, L. & F.	Whiteley, L. & F.	Dempster, L. & F.	Shannon, L. & F.	Duggan, L. & F.	Pelletier, L. & F.	
1	54	104	85	8	129	179	5	82	131	50	60	97	92	11	93	60	75	68	60	59	62	66	65	63	63	68	63
2	32	71	61	6	86	93	4	52	91	33	40	67	67	4	60	44	46	47	48	42	47	39	39	41	47	43	43
3	46	84	30	16	87	98	9	71	99	19	57	85	41	14	70	56	60	56	52	53	56	57	60	58	61	60	60
4	56	188	78	12	121	225	9	78	211	45	65	191	66	24	108	66	79	80	75	71	79	73	72	79	86	70	70
5	47	178	108	18	121	247	16	83	228	47	64	174	115	23	105	67	73	73	69	63	63	67	66	65	82	65	65
6	44	136	48	20	87	168	14	65	163	28	55	138	47	23	75	54	62	60	55	56	53	56	54	64	69	48	48
7	52	133	34	7	83	156	3	72	145	21	68	128	36	6	84	67	68	63	59	57	61	61	62	66	77	61	61
8	34	48	96	8	110	81	3	12	72	47	59	46	68	12	94	67	71	66	73	59	62	61	67	66	68	62	62
9	41	201	9	6	48	213	5	53	212	7	46	204	8	8	58	45	51	40	46	41	44	44	43	46	46	52	42
10	135	225	120	41	246	271	29	227	245	77	166	215	110	51	236	176	188	176	181	168	165	181	165	165	176	29	182
11	108	165	170	45	271	241	35	201	233	90	167	183	139	55	273	172	193	183	203	180	172	170	168	168	181	184	184
12	127	246	65	60	207	292	38	189	279	36	172	244	56	67	218	109	176	155	166	154	150	162	160	164	28	163	163
13	68	116	24	26	98	122	23	88	121	18	82	104	22	29	104	95	86	89	86	79	81	84	82	86	95	83	83
14	167	195	78	89	279	244	66	232	227	59	207	204	75	100	261	217	235	216	221	215	216	218	225	229	229	216	216
15	111	236	38	55	167	250	47	177	244	22	156	220	31	73	198	157	161	158	155	147	149	145	150	167	171	145	145
16	123	112	108	45	240	125	30	242	112	43	223	99	73	38	241	265	218	219	213	194	207	205	216	210	210	214	214
17	12	143	201	45	371	163	27	213	119	99	225	142	161	43	285	232	259	234	252	222	227	217	225	219	219	219	219
18	41	77	102	18	159	99	9	113	94	41	167	63	82	16	149	113	118	105	119	104	96	92	98	98	100	100	100
19	192	158	135	82	352	195	70	303	181	92	263	143	141	90	346	272	283	280	271	267	270	271	269	269	267	267	267
20	122	128	119	46	283	111	12	221	132	77	2	10	104	52	244	201	224	203	208	202	198	194	199	199	193	209	209
21	151	128	146	79	378	138	48	348	149	80	272	123	112	60	342	282	273	262	285	241	248	241	253	242	242	257	257
22	65	87	101	30	189	88	22	161	72	51	136	67	86	26	171	128	151	151	158	139	127	133	135	130	135	132	132
23	117	62	96	60	247	81	45	213	75	64	183	58	80	63	211	179	149	187	186	180	179	173	192	181	179	144	144
24	39	32	66	15	118	39	10	95	28	34	73	21	55	14	78	68	73	73	75	70	73	63	71	70	70	76	76
25	108	104	132	60	248	107	48	211	103	85	195	87	103	78	220	177	202	195	204	183	185	181	195	183	185	192	192
26	161	160	206	78	410	109	57	337	167	106	288	129	172	81	330	276	288	301	297	264	276	276	280	266	278	286	286
27	101	121	106	64	256	125	52	227	110	74	263	94	89	66	211	19	195	207	194	186	186	186	193	168	176	199	199
28	91	30	191	16	283	58	12	117	35	191	109	35	194	15	117	112	115	117	111	115	114	111	111	112	106	113	113
29	85	18	78	6	149	37	6	93	20	78	89	18	77	5	93	92	91	90	91	94	92	92	94	93	88	94	94
30	51	23	20	11	75	25	12	66	25	18	58	21	26	12	65	60	62	65	60	61	60	61	61	61	59	60	60

SILVER BOW COUNTY—Continued.

Precinct No.	Congress						Asso. Justice		Judge 2d Jud. Dist.		State Senator			Fusion Representatives													
	Dee, L. & F.....	Evans, D.....	Dixon, R.....	Sproule, S.....	Holloway, R.....	Leslie, D.....	Cameron, S.....	McClerman, A. T. D.*.....	Noon, D.....	Shropshire, R.....	Tewey, A. T. D.* & F.....	Gilchrist, D.....	Gillis, R.....	Smith, S.....	Mullins, A. T. D.* & F.....	Lynch, A. T. D.* & F.....	Maginnis, A. T. D.*.....	Farmer, A. T. D.* & F.....	Stapleton, A. T. D.* & F.....	Lieneman, A. T. D.* & F.....	Axtell, L. & F.....	Whiteley, L. & F.....	Dempster, L. & F.....	Shannon, L. & F.....	Duggan, L. & F.....	Pelletier, L. & F.....	
31	81	40	101	28	169	94	18	127	81	66	108	41	109	25	122	110	117	116	115	109	113	110	111	112	112	110	112
32	106	55	81	27	215	58	21	155	57	55	144	41	79	29	179	153	163	166	157	155	153	154	151	156	167	162	162
33	88	102	83	36	170	140	31	134	132	51	128	104	80	36	144	136	135	130	131	129	129	129	132	132	137	134	134
34	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
35	10	2	8	0	23	2	0	18	4	4	18	2	6	0	18	15	17	21	18	18	17	17	17	17	15	15	20
36	6	4	8	6	17	15	4	21	5	5	18	5	6	5	17	16	13	16	15	14	16	17	17	17	16	17	17
37	4	4	10	0	12	7	0	9	4	8	8	2	11	0	6	8	9	8	8	5	4	4	7	7	6	7	9
38	6	1	9	5	18	1	4	12	1	6	9	1	9	5	8	6	6	6	8	5	9	7	6	9	6	6	9
39	3	10	14	3	16	15	3	6	12	13	7	9	16	3	7	6	7	6	6	6	6	7	7	6	6	6	6
40	8	9	7	0	14	11	2	12	11	6	13	7	8	1	13	15	13	12	12	13	11	11	14	11	10	12	12
41	14	25	5	1	21	23	1	16	24	4	18	20	6	1	20	20	18	21	19	20	17	17	17	18	17	18	18
42	4	5	11	1	13	6	1	9	5	3	5	2	11	1	5	4	4	5	3	4	4	5	4	5	6	4	5
43	4	3	15	0	20	3	0	10	2	12	5	3	15	0	8	6	7	4	6	6	4	5	4	5	4	4	4
44	14	19	24	0	40	16	0	16	17	23	24	14	21	0	24	20	18	24	25	21	19	21	23	21	19	21	21
45	5	3	3	0	11	2	0	6	1	4	7	2	4	0	10	6	7	7	8	9	7	7	6	7	7	7	7
46	2	6	10	0	16	5	0	3	7	11	4	4	13	0	5	3	3	5	3	4	3	3	2	4	2	2	3
47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
48	2	11	4	0	6	9	2	3	11	4	1	4	13	.....	2	2	2	10	4	2	2	2	2	2	2	2	6
49	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
50	1	19	0	0	1	19	0	0	19	0	0	0	0	1	0	0	0	3	5	4	3	2	2	4	3	.....	.....
51	213	108	179	63	388	151	50	297	131	114	242	89	183	76	285	266	274	265	272	264	268	270	268	266	271	276	276
52	18	73	6	9	30	78	8	25	74	6	31	66	9	11	30	26	24	23	21	23	22	23	24	24	33	23	23
53	65	53	63	29	146	60	18	117	50	31	89	47	56	39	110	88	104	102	106	87	95	96	98	97	98	97	97
Tot.	3,344	4,288	3,495	1,260	7,310	5,126	929	5,783	4,799	2,163	4,963	3,999	3,185	1,386	6,030	4,955	5,319	5,170	5,212	4,868	4,898	4,895	4,985	4,956	5,138	5,015	5,015

* Anti-Trust Democrat.

SILVER BOW COUNTY—Continued.

Precinct No.....	Representatives										Sheriff			Clerk and Recorder				Treasurer						
	Holden, S.....	Cooney, S.....	Herbst, S.....	Panky, S.....	Hoggsett, S.....	Spiegel, S.....	Billz, S.....	Cox, S.....	Sager, S.....	Pierce, S.....	Lea, S.....	Scott, S.....	Quinn, L. & F ..	Kilgallon, D.....	Kohl, R.....	Smith, S.....	Weston, P. F.	Ryan, D.....	Whipps, R.....	Ament, S.....	Maher, A. T. D.* & F.....	Finlen, D.....	Long, R.....	Giersen, S.....
1	7	8	7	8	8	10	8	10	12	9	9	9	127	71	64	7	66	109	76	7	61	105	87	6
2	6	6	6	6	6	5	6	6	5	5	5	5	64	62	59	1	47	69	55	5	33	69	65	3
3	9	10	10	9	9	10	8	8	9	8	9	8	102	61	31	8	57	98	24	8	50	92	33	7
4	12	13	14	13	13	13	12	12	13	15	13	15	168	132	49	8	56	211	59	9	74	187	60	8
5	18	19	20	19	18	19	18	21	18	21	20	22	167	134	74	17	59	211	85	15	65	171	108	16
6	18	21	18	18	16	18	16	19	17	16	18	18	146	91	31	9	59	151	38	15	72	137	44	16
7	7	3	3	3	3	4	4	4	4	4	4	5	133	84	27	3	62	144	33	6	51	115	36	4
8	8	7	5	4	4	4	4	4	5	5	5	4	84	53	67	5	66	72	62	4	52	66	82	5
9	9	6	6	6	6	7	6	6	6	7	6	6	133	133	6	3	48	214	7	5	201	201	7	5
10	39	38	37	35	36	34	34	38	36	38	38	37	322	194	68	20	148	268	165	28	205	203	116	31
11	41	42	40	41	39	40	39	40	40	42	39	39	249	189	95	34	150	231	113	33	146	216	141	34
12	53	52	54	51	50	51	49	50	50	51	52	46	331	154	37	31	153	286	46	43	181	241	53	48
13	24	25	24	24	24	25	24	25	25	25	26	25	141	72	15	18	73	133	20	24	80	116	24	22
14	81	82	88	82	81	81	80	83	82	83	79	81	353	139	65	5	215	257	67	74	223	219	71	72
15	53	51	52	49	49	51	52	51	51	50	47	48	305	136	22	33	147	255	26	45	174	230	25	47
16	40	40	37	36	37	36	36	36	37	38	38	37	247	94	68	30	173	132	73	35	170	131	89	33
17	38	40	36	37	37	34	34	34	36	38	40	41	266	175	118	24	212	164	140	33	194	186	153	38
18	16	17	10	10	8	10	9	13	14	15	13	15	117	94	38	5	96	94	73	5	93	84	89	6
19	84	81	77	86	82	82	85	83	92	89	85	88	352	103	120	75	235	166	129	78	239	163	134	85
20	38	41	45	41	40	40	41	40	40	39	39	43	278	91	82	26	171	133	99	23	196	140	87	31
21	53	51	48	52	49	46	45	49	53	51	50	50	316	138	106	45	243	147	102	44	221	178	101	47
22	25	27	21	21	21	21	21	22	25	26	26	26	152	85	68	20	112	107	67	20	126	75	91	19
23	55	47	49	46	48	47	48	47	49	49	47	48	211	66	84	44	202	83	81	51	168	70	96	51
24	16	16	15	16	18	14	15	17	13	18	16	16	77	25	55	13	83	28	44	13	69	32	55	15
25	62	54	60	59	63	62	60	61	64	67	61	62	265	98	110	52	171	115	108	55	164	111	112	58
26	82	77	80	72	77	73	72	72	71	79	73	75	319	142	106	62	297	163	162	68	236	168	181	71
27	57	59	60	58	58	55	56	62	60	65	57	65	211	103	92	49	195	121	101	47	184	117	92	56
28	27	11	11	11	12	12	12	12	12	12	12	12	123	35	186	11	135	36	185	13	102	58	179	15
29	4	3	3	3	3	3	3	3	3	3	3	3	87	20	79	5	86	18	82	4	87	21	79	4
30	13	10	13	12	12	12	12	12	12	12	12	11	67	23	20	9	65	20	19	10	61	21	23	11

SILVER BOW COUNTY—Continued.

Precinct No.....	Representatives												Sheriff			Clerk and Recorder				Treasurer				
	Holden, S.....	Cooney, S.....	Herbst, S.....	Panky, S.....	Hoggsett, S.....	Spiegel, S.....	Bietz, S.....	Cox, S.....	Sager, S.....	Pierce, S.....	Lea, S.....	Scott, S.....	Quinn, L. & F...	Kilgallon, D.....	Kohl, R.....	Smith, S.....	Weston, P. & F...	Ryan, D.....	Whipps, R.....	Ament, S.....	Maher, A. T. D.* & F.....	Finlen, D.....	Long, R.....	Glerson, S.....
31	24	19	23	24	23	22	23	23	26	23	24	24	131	44	79	24	121	52	96	24	100	50	96	21
32	27	24	24	23	24	24	24	24	24	24	25	23	160	46	75	22	144	54	70	23	134	61	69	26
33	32	32	33	36	33	33	34	37	34	35	33	34	128	100	96	30	125	111	75	32	120	108	77	32
34	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
36	4	4	4	4	4	4	4	5	6	5	5	5	24	3	5	5	16	11	4	5	22	3	4	5
37	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
38	6	6	6	6	6	6	6	6	6	6	6	6	7	0	10	6	6	2	7	7	4	8	5	7
39	3	3	3	3	3	3	3	3	3	3	3	3	7	9	17	2	6	9	17	3	5	12	16	3
40	1	1	1	1	1	1	1	1	1	2	1	1	13	11	7	0	12	11	5	1	13	11	6	1
41	1	1	1	1	1	1	1	1	1	2	1	1	19	21	7	1	19	22	6	0	19	23	6	1
42	1	1	1	1	1	1	1	1	1	1	1	1	9	4	5	1	4	3	12	0	3	2	10	0
43	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	4	15	0	27	18	4	0	11	14	16	0
44	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23	25	13	0	8	2	3	0	24	2	4	0
45	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	2	3	0	3	6	12	0	6	5	12	0
46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	5	11	0	.....	.....	.....	.....	.....	.....	.....	.....
47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
48	1	2	1	1	1	1	1	1	1	1	2	2	5	6	6	1	7	6	5	2	3	7	7	1
49	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
51	59	58	60	58	64	60	60	61	63	64	58	62	292	95	143	65	312	101	142	59	260	104	153	60
52	9	8	9	9	9	10	10	10	10	10	11	11	76	32	5	4	41	81	5	8	41	64	5	8
53	23	28	25	24	24	23	26	24	26	29	23	25	128	40	47	18	92	58	47	26	85	48	60	28
Tot.	1,161	1,144	1,141	1,119	1,124	1,107	1,004	1,145	1,156	1,186	1,135	1,159	6,920	3,459	2,688	901	4,852	4,821	2,819	1,009	4,748	4,43	3,088	1,09

* Anti-Trust Democrat.

SILVER BOW COUNTY—Continued.

Precinct No.	Attorney		Assessor				Auditor		Surveyor					
	Breen, P. and F..	Templeman, D....	Grice, R.....	Brown, P. and F..	Murray, D.....	Strasberger, R....	Van Horne, S.....	Crossman, F.....	Hartnett, D.....	Houston, R.....	Tiggerman, S.....	Frank, A. T. D. * and F.....	Strasberger, D....	Munroe, R.....
1	73	101	79	56	139	62	5	67	109	78	5	57	103	85
2	46	77	56	29	115	38	2	39	77	54	5	32	77	69
3	61	85	36	33	148	15	4	41	100	30	7	41	93	31
4	103	172	63	69	218	48	9	53	218	57	10	59	187	69
5	87	170	97	72	200	86	17	62	189	96	20	59	178	101
6	77	133	43	57	155	37	12	51	150	40	18	55	144	41
7	77	119	33	61	141	29	4	48	116	30	4	59	127	32
8	67	65	68	75	62	59	6	75	58	57	8	52	68	70
9	71	182	7	47	207	5	6	32	216	6	5	36	201	9
10	219	210	118	151	273	97	30	149	268	100	31	145	225	105
11	182	212	123	119	205	115	33	147	219	109	39	142	222	118
12	224	212	56	167	268	41	47	144	285	42	44	156	245	40
13	94	99	28	71	127	20	22	68	132	18	23	74	113	21
14	237	214	85	219	127	61	77	200	240	67	72	206	207	72
15	180	211	37	153	247	25	49	129	261	24	49	147	228	26
16	169	132	91	189	116	73	31	188	118	57	34	180	111	68
17	194	200	150	207	138	172	34	215	153	142	36	210	176	121
18	107	89	69	95	77	97	8	104	84	69	9	96	101	62
19	235	165	146	237	164	120	79	239	165	119	77	234	157	127
20	174	140	120	190	123	92	29	184	155	86	28	181	118	99
21	200	166	162	248	134	118	49	238	140	92	55	169	156	87
22	116	94	90	123	71	94	21	131	72	72	22	99	98	68
23	174	73	94	199	69	79	49	187	69	77	51	169	68	85
24	65	39	50	77	29	46	15	90	25	47	13	74	31	46
25	149	117	139	176	100	109	62	172	108	94	56	167	87	111
26	232	170	201	280	138	172	80	273	137	155	81	237	170	161
27	164	124	102	217	102	73	54	195	117	77	56	186	107	84
28	100	41	196	126	38	182	13	116	31	186	14	115	33	186
29	86	29	82	87	18	80	40	85	17	83	4	85	17	82
30	63	21	22	62	21	21	11	61	22	21	10	62	19	22

SILVER BOW COUNTY—Continued.

Precinct No.	Attorney				Assessor				Auditor				Surveyor			
	Breen, P. and F...	Templeman, D....	Grice, R.....	Brown, P. and F..	Murray, D.....	Strasberger, R....	Van Horne, S....	Crossman, F.....	Hartnett, D.....	Houston, R.....	Tiggerman, S.....	Frank, A. T. D* and F.....	Strasberger, D...	Munroe, R.....		
31	97	65	100	109	46	91	22	100	55	89	19	103	42	100		
32	141	55	76	155	49	63	26	155	51	67	24	140	45	60		
33	127	111	76	129	110	73	32	111	115	65	31	120	107	71		
34																
35	12	5	6	15	2	5	0	13	2	6	0	13	3	6		
36	23	2	6	20	5	6	5	14	7	6	6	12	5	5		
37	4	5	8	7	3	9	0	7	4	6	0	6	6	8		
38	7	3	8	5	2	8	7	3	2	8	7	6	2	8		
39	3	10	17	7	9	15	3	5	6	18	0	5	8	19		
40	13	11	6	12	11	6	2	12	11	7	1	10	13	6		
41	18	22	5	21	21	6	0	18	20	5	0	17	20	6		
42	3	8	9	15	1	5	0	7	1	6	0	4	1	10		
43	4	6	13	7	2	13	0	5	2	16	0	4	5	14		
44	26	15	16	35	7	16	0	24	16	15	0	21	16	17		
45	6	2	4	7	2	3	0	7	2	3	0	7	2	3		
46	3	4	13	8	3	11	0	6	3	11	0	4	3	11		
47																
48	1	9	7	4	10	3	1	3	10	4	1	1	9	6		
49	2	18	0	0	19	0	0	0	19	0	0	0	19	6		
50	2	3	3	7	0	1	0	3	1	4	0	5	1	2		
51	251	121	154	280	98	150	63	280	91	145	64	283	97	141		
52	41	62	6	31	75	5	7	21	82	5	6	26	69	5		
53	109	48	57	99	51	49	27	98	45	47	27	75	55	54		
Totals	4,917	4,438	3,224	4,913	4,596	2,804	1,057	4,675	4,403	2,718	1,072	4,426	4,395	2,837		

* Anti-Trust Democrat.

SILVER BOW COUNTY—Continued.

Precinct No.	Superintendent of Schools				Coroner				Public Administrator				For Bonds.....	Against Bonds ..	Repre- sentative
	Loughrin, A. T. D.* and F.....	Laird, D.....	Blake, R.....	Bowden, S.....	Johnson, L and F.	Egan, D.....	Tachell, R.....	Calder, S	May, L. and F....	Melville, D.....	Chauvin, R.....	Barry, S			
1	55	108	87	6	49	130	90	4	48	118	78	6	31	200	McGuire, I.....
2	40	69	67	2	30	82	65	3	27	93	47	3	17	149	
3	51	93	40	6	37	110	32	5	38	122	25	4	14	155	
4	46	219	73	12	33	236	72	9	49	200	60	9	38	213	
5	55	180	114	16	42	211	114	16	54	181	107	16	33	257	
6	46	147	60	12	32	171	51	12	35	152	44	15	32	180	
7	56	132	36	4	27	170	35	3	52	126	30	4	28	131	
8	54	59	85	6	48	72	80	6	57	68	59	6	53	152	
9	44	207	7	5	23	232	7	4	35	203	8	5	18	119	
10	161	228	143	26	109	331	118	19	142	240	100	30	57	350	
11	161	202	141	32	112	262	143	32	130	221	119	40	120	354	
12	152	273	62	44	101	346	53	39	144	246	51	42	118	356	
13	75	119	24	22	49	152	24	22	68	117	22	24	37	151	
14	224	216	82	65	138	325	83	56	197	217	68	68	115	381	
15	172	236	31	43	107	303	32	41	142	229	30	47	103	244	
16	178	119	86	31	134	171	79	33	169	108	78	32	123	220	
17	205	152	178	25	181	197	153	21	193	154	141	32	.....	.....
18	98	79	88	6	86	96	83	7	87	89	80	7	63	200	
19	222	147	168	81	202	216	127	75	215	156	125	82	123	405	
20	197	115	109	26	153	183	93	26	163	126	88	30	134	185	
21	233	138	128	45	183	221	103	47	198	137	109	47	218	280	
22	106	85	101	20	98	106	89	22	98	90	76	24	91	240	
23	162	69	102	48	162	88	85	49	157	72	79	50	105	170	
24	57	24	79	11	84	28	46	13	68	24	60	13	46	115	
25	164	88	137	48	155	121	115	45	156	100	97	61	.....	.....
26	238	128	228	65	224	191	182	62	131	154	169	78	163	283	
27	174	91	137	45	176	106	114	43	164	109	83	57	132	305	
28	105	35	195	14	102	40	188	14	103	36	175	16	44	107	
29	80	20	85	4	87	18	80	4	87	16	77	4	18	50	
30	63	20	24	10	63	20	23	11	63	19	20	11	16	68	

SILVER BOW COUNTY—Continued.

Precinct No.	Superintendent of Schools				Coroner			Public Administrator				For Amendment.....	Against Amendment...	For Bonds.....	Against Bonds.....	Representative
	Loughrin, A. T. D.* and F.....	Daird, D.....	Blake, R.....	Bowden, S.....	Johnson, L. and F.	Egan, D.....	Tachell, R.....	Calder, S.....	May, L. ann F....	Melville, D.....	Chauvin, R.....	Barry, S.....				McGuire, I.....
31	90	39	127	16	108	53	102	17	99	43	95	18	21	66	165	.....
32	120	50	94	25	127	78	69	22	130	50	69	25	121	61	171	.....
33	127	103	81	30	146	118	60	25	121	110	69	32	16	64	154	.....
34 .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
35	15	0	8	0	13	2	6	0	9	1	11	0	0	6	20	.....
36	19	6	6	5	13	7	11	6	17	6	5	5	6	26	10	.....
37	3	3	10	0	10	4	6	0	5	4	8	1	0	3	19	.....
38	7	2	8	6	5	2	8	6	5	2	9	6	2	4	17	.....
39	4	6	19	3	7	9	15	3	5	9	16	3	3	15	17	.....
40	12	12	5	2	14	10	6	1	12	11	7	1	1	15	10	.....
41	18	20	5	2	15	28	5	0	15	24	5	0	4	14	22	.....
42	6	3	11	0	8	3	6	1	6	3	6	0	3	4	19	.....
43	7	2	13	2	3	4	16	0	3	2	16	0	4	6	19	.....
44	20	17	20	0	37	14	10	0	13	17	20	0	5	14	41	.....
45	5	3	4	0	7	2	3	0	7	1	4	0	6	2	6	.....
46	3	4	14	0	2	13	6	0	4	4	13	0	0	5	18	.....
47 .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
48	2	8	7	1	6	6	5	1	1	8	8	1	1	1	18	.....
49	0	19	1	0	1	19	1	0	0	19	0	0	2	2	8	.....
50	2	2	4	0	3	2	3	0	4	1	0	0	2	4	3	.....
51	218	85	215	54	277	106	144	49	240	94	145	56	.....	138	333	.....
52	33	71	5	7	19	88	7	4	25	72	5	6	5	21	65	.....
53	86	46	74	22	76	65	58	22	79	60	48	31	25	43	177	.....
Total ..	4,471	4,299	3,628	955	3,924	5,568	3,106	900	4,175	4,464	2,848	1,048	1,098	2,604	7,429	1

* Anti-Trust Democrat.

SWEET GRASS COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress				Associate Justice		Representative		Sheriff		
	Dixon, R.....	Evans, D.....	Dee, L.....	Sproule, S.....	Holloway, R.....	Leslie, D.....	Cameron, S.....	Brownlee, R.....	Cowles, D.....	Fallang, R.....	Briner, D.....
Big Timber	156	78	3	2	170	80	1	156	96	185	71
Melville	41	8	1	.....	43	7	.....	44	8	44	8
Fish Creek	13	1	.....	.....	16	1	.....	15	2	13	4
Grey Cliff	20	17	1	.....	24	17	.....	24	19	33	14
Howie	22	8	.....	.....	23	7	.....	24	6	23	7
McLeod	32	24	.....	1	29	26	.....	32	26	28	31
Springdale	10	10	.....	.....	12	10	.....	13	9	13	9
Wormser	21	6	.....	.....	21	5	.....	23	5	23	4
Upper Stillwater	17	12	.....	.....	17	14	.....	18	13	22	8
Lower Stillwater	6	8	.....	1	7	8	1	7	8	4	12
Cowles	5	9	2	1	6	9	1	5	9	6	11
Blakely	3	3	.....	.....	5	1	.....	1	5	4	2
American Fork	16	2	.....	.....	17	2	.....	18	.....	17	2
Merrill	14	14	1	.....	16	16	.....	13	18	20	13
Totals	376	200	8	5	46	203	3	393	224	435	196

SWEET GRASS COUNTY—Continued.

PRECINCTS	Treasurer		Clk. & Recorder		Assessor		Attorney		Supt. Schools		Surveyor	
	Geiger, R.....	Bailey, D.....	Allen, R.....	Cochran, D.....	Jarrett, R.....	Tessier, D.....	Hall, R.....	Hatch, D.....	Webster, R.....	Maupin, D.....	Walvoord, R.....	Craft, D.....
Big Timber	137	119	127	130	141	112	116	138	130	126	154	99
Melville	44	8	30	21	15	36	29	22	42	10	43	9
Fish Creek	15	1	11	6	4	13	10	6	14	3	14	1
Grey Cliff	24	20	28	18	25	20	22	24	22	23	22	21
Howie	21	9	18	12	21	9	19	11	21	9	23	7
McLeod	35	24	22	36	40	18	36	23	30	29	12	45
Springdale	14	8	10	12	17	4	10	12	13	9	10	10
Wormser	20	8	15	13	17	9	14	11	22	4	24	3
Upper Stillwater	23	8	16	15	19	12	19	12	20	11	15	11
Lower Stillwater	9	7	5	11	8	8	8	8	7	9	7	8
Cowles	9	8	8	9	7	10	3	14	7	10	3	11
Blakeley	5	1	1	5	5	1	4	2	4	2	3	3
American Fork	14	4	14	5	5	14	15	4	15	4	18	.....
Merrill	19	14	14	18	16	17	11	22	6	27	18	14
Totals	389	239	319	311	340	233	316	309	353	276	366	239

For the Amendment, 73. Against the Amendment, 117.

TETON COUNTY—ELECTION RETURNS—Cont inued.

PRECINCTS	Congress			Associate Justice		Senator	Rep.	County Commissioners									
	Dixon, R.....	Evans, D.....	Sproule, S.....	Dee, L.....	Holloway, R.....	Leslie, D.....	Cameron, S.....	Connelly, R.....	Ralston, D.....	Webb, R.....	Wilcox, D.....	Cowgill, R.....	Braren, R.....	Bollerud, R.....	Radcliffe, D.....	Dennis, D.....	Connor, D.....
Choteau	134	76	2	.....	131	84	2	105	116	136	82	102	67	137	110	149	62
Dupuyer	80	56	2	1	175	71	2	64	86	83	63	77	69	61	65	82	47
Birch Creek	44	33	.....	.....	50	31	.....	58	31	47	32	52	30	31	31	53	60
Shelby	80	67	.....	.....	81	75	.....	90	78	54	107	84	109	72	66	59	50
Cut Bank.....	36	30	.....	.....	36	33	1	35	34	35	33	31	32	27	25	33	24
Bynum	36	22	4	.....	33	26	4	27	38	39	24	34	31	32	32	30	23
Farmington.....	43	9	3	.....	44	11	3	33	24	50	7	39	33	53	12	27	6
Lake Basin	5	2	.....	.....	4	3	.....	5	2	6	1	4	4	4	2	3	2
Lowry	18	20	.....	.....	15	22	.....	11	28	25	16	22	20	17	19	14	18
Bellevue	16	19	1	1	17	19	1	13	25	21	17	11	13	22	29	21	14
Raymond	22	11	2	2	27	11	2	21	18	31	8	22	13	23	26	20	11
Pondera	27	24	.....	.....	26	28	1	22	31	25	28	24	26	28	25	22	22
Collins	6	4	.....	.....	6	4	.....	5	4	6	3	6	3	3	5	4	4
North Fork	3	4	.....	.....	3	4	.....	4	3	4	3	4	3	3	4	4	2
Sweet Grass	13	3	.....	.....	13	3	.....	8	9	7	10	15	16	12	2	1	2
St. Mary's	22	18	.....	.....	26	17	.....	25	19	23	20	23	17	20	19	22	17
Totals	585	398	13	4	587	442	16	525	546	592	454	550	486	515	472	541	361

TETON COUNTY—Continued.

PRECINCTS	Sheriff		Co. Clk.		Treas.		Assessor		Attorney		Supt. Schools		Surveyor		Pub. Adm'r		Coroner	
	Taylor, (G. C.) R.	Taylor, (C. W.) D.	Warner, R.	Aspling, D.	Gordon, R.	Kellogg, D.	Larson, R.	Armstrong, D.	Sulgrove, R.	Erickson, D.	Acton, R	Brown, D.	Shields, R.	Mathews, D	Franklin, R.	Kufus, D.	Stearns, R.	Wine, D.
Choteau	100	125	149	73	157	62	139	84	80	144	126	98	121	90	126	89	120	87
Dupuyer	95	61	40	114	92	52	88	60	43	104	66	87	64	82	71	63	51	92
Biren Creek	31	54	21	65	57	22	31	51	47	35	42	40	46	34	44	34	36	43
Shelby	83	89	99	71	97	59	94	65	60	100	77	87	75	87	85	66	80	72
Cut Bank	31	39	35	33	44	23	28	37	37	31	29	41	36	29	35	27	31	31
Bynum	27	37	31	32	42	21	37	26	24	38	32	33	25	38	33	28	32	29
Farmington	34	24	54	5	55	3	55	3	11	46	25	33	30	26	26	30	43	13
Lake Basin	4	3	7	.....	7	.....	6	1	6	1	4	3	6	1	5	2	5	2
Lowry	6	34	25	14	23	19	22	18	17	22	25	17	21	20	16	21	17	18
Bellevue	11	29	23	17	19	20	24	15	13	25	15	17	17	19	18	18	16	18
Raymond	28	13	24	15	33	8	32	9	19	20	23	18	26	14	22	13	20	17
Pondera	22	33	27	26	31	21	30	26	19	36	23	31	21	32	28	25	28	23
Collins	4	6	9	1	8	2	9	.....	4	6	7	3	4	6	6	4	6	4
North Fork	2	5	4	3	4	3	6	1	2	5	2	5	3	4	4	3	3	3
Sweet Grass	12	5	15	2	16	1	16	1	13	4	13	3	13	3	14	3	13	2
St. Mary's	12	32	14	30	26	16	17	26	18	25	29	13	23	19	17	14	26	17
Totals	502	589	577	501	711	332	634	422	413	642	538	538	531	513	560	440	527	474

For the Amendment, 291. Against the Amendment, 119.

VALLEY COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress			Asso. Justice Jdg.		Senator	Represent- atives	Sheriff		Treas'r	Clerk and Recorder	Assessor	Att'y								
	Dixon, R.....	Evans, D.....	Dee, L.....	Sproule, S.....	Holloway, R.....	Leslie, D.....	Cameron, S.....	Tattan, D.....	Shanley, R.....	Mahon, D.....	Vagg, R.....	Smith, D.....	Cornwell, R.....	Cosner, D.....	Kane, R.....	Small, D.....	Crossett, R.....	Nichols, D.....	Fox, R.....	Bowers, D.....	Kerr, R.....
Malta	75	50			75	52		93	69	71	87	46	26	117	72	66	85	50	85	51	80
Saco	66	33			68	33	61	42	56	42	82	19	49	53	41	60	81	21	78	20	70
Hinsdale	31	32			35	35	60	27	49	49	41	32	21	55	29	44	33	40	50	22	43
Glasgow	101	91	1	2	100	94	2	166	80	129	100	106	108	100	86	124	112	91	157	49	125
Nashua	17	29			17	20		24	15	22	18	19	19	17	11	25	20	18	24	12	19
Culbertson	54	29	1		58	27	81	36	51	36	62	25	52	39	35	55	43	25	41	47	67
Springdale	6	13	1		8	13	20	5	16	16	6	16	3	18	3	19	8	14	5	15	8
Plentywood	5	5			5	5	8	4	6	6	5	5	4	7	3	8	5	6	5	6	5
Poplar	38		1		38		6	34			37	2	32	7	35	4	39		38	1	38
Buggy Creek	17	4			17	4	8	16	16	5	16	5	20	1	11	10	15	6	18	2	17
Killwoman	1	5			1	5	6			5	1	4		8	3	5	3	4	2	6	2
Scobey	5				8		7	7	7	1	6	1	7	1	8		8		8		7
Totals	419	282	4	2	430	288	2	540	369	382	461	280	341	423	337	420	472	275	511	231	41

VALLEY COUNTY—Continued.

PRECINCTS	Coroner		Supt. Schools		Surveyor		Pub. Adm'r		Commissioners					
	Chester, R.....	Kent, D.....	Humphrey, R.....	Cutting, D.....	Patten, R.....	Patten, D.....	Tweedie, R	Williams, D.....	Cushing, R.....	Gibson, R.....	Mills, R.....	Mitchell, D.....	Snead, D.....	Brockway, L.....
Malta	69	54	100	30	80	53	99	32	41	70	84	54	34	110
Saco	55	38	71	20	26	.....	70	25	46	61	89	40	21	28
Hinsdale	36	31	19	54	32	.....	31	32	13	16	36	47	66	30
Glasgow	60	130	107	101	130	38	91	93	70	101	100	115	97	91
Nashua	16	21	26	12	38	.....	18	17	15	16	14	20	18	16
Culbertson	53	28	53	38	82	.....	44	42	57	43	51	40	24	29
Springdale	5	16	5	17	22	.....	4	18	3	4	8	19	11	15
Plentywood	5	5	2	9	11	.....	5	5	6	4	4	9	6	4
Poplar	39	.....	39	.....	39	.....	38	1	35	36	37	4	1	1
Buggy Creek	17	4	13	7	19	.....	16	4	13	16	17	4	7	3
Killwoman .....	.....	5	1	7	3	1	.....	6	2	4	.....	2	1	8
Scobey	8	.....	8	.....	8	.....	6	1	8	6	6	.....	.....	.....
Totals	363	332	444	315	490	92	422	276	309	377	446	354	285	335

For the Amendment, 230. Against the Amendment, 68.

YELLOWSTONE COUNTY—ELECTION RETURNS—Continued.

PRECINCTS	Congress			Associate Justice			Senator		Representative		Sheriff		Treasurer		
	Evans, D.....	Dixon, R.....	Sproule, S.....	Dee, L.....	Leslie, D.....	Holloway, R.....	Cameron, S.....	Gruwell, D.....	Yegen, R.....	Morse, D.....	Bever, R.....	Hubbard, D.....	Calhoun, R.....	Burla, D.....	Deverill, R.....
Junction 1.....	4	15	.....	.....	4	16	.....	12	10	4	15	12	10	3	16
North Billings 2.....	102	111	6	3	95	128	6	140	89	128	100	136	97	122	108
South Billings 3.....	80	83	20	1	72	96	16	142	106	104	84	138	67	149	50
Canyon Creek 4.....	46	29	1	.....	44	28	1	45	32	50	24	56	20	51	23
Laurel 5.....	31	74	1	.....	31	73	1	33	76	42	63	63	51	75	40
Park City 6.....	29	78	7	.....	29	81	.....	41	71	36	74	63	52	57	60
Columbus 7.....	36	56	1	.....	37	63	.....	40	53	43	60	51	51	38	60
Thomas 8.....	4	9	.....	.....	3	11	.....	3	11	3	11	3	11	4	10
Upper Musselshell 9.....	15	4	.....	.....	17	3	.....	19	2	5	15	21	.....	4	16
Roundup 10.....	6	15	.....	.....	6	14	.....	6	15	7	13	8	13	8	13
Fairview 11.....	2	5	.....	.....	2	4	.....	1	6	2	5	3	4	5	2
Musselshell 12.....	28	34	.....	.....	27	38	.....	32	36	40	29	46	24	33	37
North Billings 13.....	111	176	9	.....	88	202	6	171	135	161	135	128	120	145	162
South Billings 14.....	78	119	14	6	68	132	10	98	132	110	107	131	101	135	92
Totals	572	808	59	17	523	890	40	733	774	774	735	*735	859	681	683

* See returns of Special Election.

YELLOWSTONE COUNTY—Continued.

PRECINCTS	Cik. & Rec.		Attorney		Assessor		Supt. Schools		Coroner		Sur- veyor	Public Adm'r		For the Amendment.....	Against the Amendment ...	Special Elec- tion for Representa- tive Held Dec. 20, 1902	
	Fish, R.....	Carwille, D.....	Matheson, D.....	Harris, R.....	LaMott, D.....	Evans, R.....	Railsback, D.....	Strang, R ..	Clarke, D.....	Rinehart, R.....	Morris, R.....	Williams, D.....	Hogue, R.....			Morse, D.....	Bever, R.....
Junction 1.....	12	10	4	17	8	13	3	17	4	16	18	5	16	.....	.....	4	8
North Billings 2.....	118	111	118	110	91	136	99	128	68	155	159	132	88	.....	.....	83	77
South Billings 3.....	86	108	105	88	89	101	82	102	76	113	124	101	78	.....	.....	80	70
Canyon Creek 4	24	52	40	32	49	25	28	46	39	37	41	42	31	.....	.....	29	24
Laurel 5.....	65	43	34	76	57	52	23	87	32	72	77	35	65	.....	.....	47	39
Park City 6	73	39	34	80	32	80	22	94	25	83	89	31	76	.....	.....	26	79
Columbus 7.....	54	48	44	56	44	55	40	61	37	63	68	47	53	.....	.....	28	47
Thomas 8.....	11	3	4	10	2	12	3	11	2	12	13	3	11	.....	.....	2	8
Upper Musselshell 9	9	12	3	14	5	16	10	9	7	11	17	11	7	.....	.....	13	1
Roundup 10.....	11	9	6	14	16	5	3	18	5	15	15	5	14	.....	.....	7	1
Fairview 11.....	5	2	1	4	2	5	1	6	.....	6	5	3	3	.....	.....	2	8
Musselshell 12	27	42	35	29	39	29	15	56	30	39	47	35	30	.....	.....	35	18
North Billings 13.....	180	122	158	144	104	199	95	199	105	193	208	142	145	.....	.....	133	124
Sou. - Billings 14	110	108	95	117	86	136	66	150	67	151	153	98	106	.....	.....	90	81
Total	785	709	681	791	624	864	490	984	497	956	1,034	690	723	351	127	579	580

SUMMARY OF THE VOTE FOR CONGRESSIONAL AND STATE OFFICERS BY COUNTIES—ELECTION NOVEMBER 4, 1902.

COUNTIES	Congress					Associate Justice			Amendment	
	Dixon.....	Evans	Dee.....	Sproule.....	Goddard.....	Holloway.....	Leslie.....	Cameron.....	For.....	Against.....
Beaverhead	874	723	19	33	.....	932	679	27	452	403
Broadwater	343	369	42	13	.....	534	275	8	167	83
Carbon	756	496	196	29	.....	994	487	18	422	184
Cascade	1,896	1,563	315	167	.....	1,620	2,361	111	1,062	754
Choteau	844	484	10	9	.....	850	546	8	327	145
Custer	559	300	22	12	.....	633	284	10	331	70
Dawson	415	160	13	9	.....	445	171	9	107	163
Deer Lodge	971	846	481	415	.....	1,502	1,178	299	633	686
Fergus	1,068	886	51	24	.....	1,162	903	22	502	481
Flathead	1,223	970	18	153	.....	1,304	885	147	463	299
Gallatin	1,064	1,023	11	117	.....	1,242	879	107	578	438
Granite	490	420	224	8	.....	773	412	15	212	187
Jefferson	523	501	229	36	.....	861	408	33	289	208
Lewis and Clarke	1,592	1,232	547	200	2	2,404	1,237	131	773	397
Madison	1,241	904	189	27	.....	1,547	848	19	555	266
Meagher	390	219	50	4	.....	479	212	3	252	68
Missoula	1,960	836	42	226	.....	1,067	1,046	234	788	392
Park	859	523	14	183	.....	935	499	181	265	234
Powell	607	458	88	14	.....	778	370	11	349	235
Ravalli	956	659	60	107	.....	1,061	695	79	415	356
Rosebud	310	248	8	5	.....	344	247	4	131	6
Silver Bow	3,495	4,288	3,344	1,260	.....	7,310	5,136	929	1,098	2,074
Sweet Grass	376	200	7	5	.....	406	203	3	73	117
Teton	585	398	4	14	.....	587	442	16	231	119
Valley	419	282	4	2	.....	430	288	2	230	63
Yellowstone	808	572	17	59	.....	890	523	40	351	127
Totals	24,626	19,560	6,005	3,131	2	31,490	21,204	2,466	11,126	8,622

MONTANA'S CASH ACCOUNTSTATEMENT OF RECEIPTS DURING THE FISCAL YEARS ENDING NOV.
30, 1901-02.

FUND	Balance on Hand Dec. 1, 1900....	Rec'd Dur- ing Year Ending Nov. 30, 1901.....	Rec'd Dur- ing Year Ending Nov. 30, 1902.....	Total
Permanent School	\$119,417 54	\$83,625 65	\$155,537 39	\$358,580 58
School Income	90,370 83	179,733 86	184,799 56	454,904 25
University Bond	19,667 74	5,728 14	15,915 66	41,311 54
Permanent University	31,295 19	18,558 11	34,029 20	83,882 50
Normal School Bond	33,444 96	38,355 63	16,640 72	88,441 31
Agricultural College Bond	1,120 81	15,871 39	9,844 04	26,836 24
Deaf and Dumb Asylum Interest and Sinking Fund	153 75	13,278 47	5,352 37	18,784 59
Reform School Building	473 75	6,394 55	7,582 05	14,450 35
State Capitol Building	78,461 95	8,488 00	.....	86,949 95
School of Mines Building	64,615 47	8,244 58	7,546 04	80,406 09
School of Mines Building Interest and Sinking Fund .....	.....	.....	30,884 24	30,884 24
General.....	71 28	714,880 29	707,848 07	1,422,799 64
Stock Inspector and Detective	18,700 79	27,107 47	24,738 74	70,547 00
Stock Indemnity	8,413 11	3,287 16	2,691 30	14,391 57
Sheep Inspection and Indemnity	6,247 59	4,500 33	4,289 73	15,037 65
State Bounty	14,394 43	160,789 67	111,867 48	287,051 58
Fish and Game	48 22	3,221 37	18,602 53	20,872 12
University Library .....	.....	1,877 00	1,716 00	3,593 00
State Law Library	116 74	466 61	405 23	988 58
Medical Board	145 45	405 00	165 00	715 45
State Examiner's .....	.....	3,725 00	4,465 00	8,190 00
Escheated Estates	7,852 76	.....	64 00	7,916 76
Soldiers' Home	2,882 14	6,130 10	5,303 36	14,315 60
Capitol Building Interest and Sinking.....	1,725 40	5,334 87	22,664 66	29,724 93
Beautifying State Capitol Grounds	751 25	6 25	6 25	763 75
Agricultural College Income Fund	14,191 53	9,829 25	7,654 36	31,675 14
Permanent Agricultural College..	.....	.....	3,632 80	3,632 80
University Building	64 48	.....	45,686 36	45,750 84
Agricultural College from U. S.....	.....	25,000 00	25,000 00	50,000 00
Total	\$514,627 16	\$1,343,838 75	\$1,454,932 14	\$3,313,398 05

STATEMENT SHOWING DISBURSEMENTS FOR THE FISCAL YEARS END-
ING NOV. 30, 1901-02.

FUND	Paid Out During Year End- ing Nov. 30, 1901...	Paid Out During Year End- ing Nov. 30, 1902..	Balance on Hand Dec. 1, 1902....	Total
Permanent School	\$164,736 67	\$74,249 64	\$119,594 27	\$358,580 58
School Income	152,591 01	158,192 97	144,120 27	454,904 25
University Bond	6,643 47	7,236 23	27,431 84	41,311 54
Permanent University	3,949 80	55,745 45	24,187 25	83,882 50
Normal School Bond	24,310 03	5,207 81	58,923 47	88,441 31
Agricultural College Bond	10,114 41	11,762 67	4,959 16	26,836 24
Deaf and Dumb Asylum Interest and Sinking Fund	9,834 79	3,386 32	5,563 48	18,784 59
Reform School Building	467 48	10,180 93	3,301 94	14,450 35
State Capitol Building	69,144 31	17,771 17	34 47	86,949 95
School of Mines Building	45,701 84	30,125 54	4,578 71	80,406 09
School of Mines Building Interest and Sinking Fund .....	.....	20,106 90	10,777 34	30,884 24
General.....	592,243 92	752,165 11	78,390 61	1,422,799 64
Stock Inspector and Detective	25,622 50	26,440 00	18,484 50	70,547 00
Stock Indemnity	4,551 92	3,961 69	5,877 96	14,391 57
Sheep Inspection and Indemnity	2,933 47	3,154 28	8,949 90	15,037 65
State Bounty	157,767 00	100,148 00	29,136 58	287,051 58
Fish and Game .....	.....	18,604 27	2,267 85	20,87 12
University Library .....	.....	1,482 41	2,110 59	3,593 00
State Law Library .....	.....	890 00	98 58	988 58
Medical Board	413 40	294 27	7 78	715 45
State Examiner's	24 30	2,026 82	5,865 64	7,916 76
Escheated Estates .....	.....	8,190 00	.....	8,190 00
Soldiers' Home	5,064 59	4,624 66	4,626 35	14,315 60
Capitol Building Interest and Sinking.....	698 35	25,199 31	3,827 27	29,724 93
Beautifying State Capitol Grounds .....	.....	400 00	363 75	763 75
Agricultural College Income Fund	1,901 30	19,825 71	9,948 13	31,675 14
Permanent Agricultural College..	.....	.....	3,632 80	3,632 80
University Building	64 48	26,522 09	19,164 27	45,750 84
Agricultural College from U. S.....	25,000 00	25,000 00	.....	50,000 00
Total	1,303,179 04	\$1,412,894 25	\$596,724 76	\$3,313,398 05

PENITENTIARY

STATEMENT SHOWING BY COUNTIES THE OFFENSES FOR WHICH
DEER LODGE DURING

Tracking No.	CRIME OF WHICH CONVICTED	Beaverhead	Broadwater	Carbon	Cascade	Chouteau	Custer	Dawson	Deer Lodge	Fergus	Flathead	Gallatin
1	Assault			1	1	1	1			1		
2	Assault to kill								1			
3	Arson								1			
4	Burglary		1		5	1	1		7	2	2	
5	Bigamy										1	
6	Cheating			1								
7	Embezzlement					1						
8	Forgery				1	3					2	
9	Grand Larceny				2	5		1	1	1	1	
10	Incest			1	1							
11	Murder			1	1	2			2	2		
12	Manslaughter		1		2	1						
13	Obt. money under false pret											
14	Opening U. S. Mail											
15	Petit Larceny—2nd offense				2	2						
16	Perjury					1		1				
17	Robbery								1			
18	Rape											
19	Sodomy								2			
20	Uttering fictitious check											
21	Total commitments, 1900		2	4	15	17	2	2	14	6	6	
22	Total in confinement Dec. 31, 1899	7		2	10	22	17	5	40	7	16	9
23	Total	7	2	6	25	39	19	7	54	13	22	9
24	Discharged 1900—Expiration	2			3	4	3		6		4	1
25	Discharged 1900—Diminution	2		1	8	6	3	2	3	1	6	3
26	Discharged 1900—Pardon				2			1	7	1	1	
27	Disch. 1900—Order of Court											
28	Escaped											
29	Died											
30	Insane removed to asylum											
31	Total	4		1	13	10	6	3	16	2	11	4
32	Total number of prisoners in confinement Dec. 31, 1900	3	2	5	12	29	13	4	35	11	11	5
33	Per cent of persons in confinement from each county Dec. 31, 1900	.87	.58	1.45	3.70	8.40	3.77	1.16	11.01	3.19	3.19	1.15

STATISTICS

PRISONERS WERE COMMITTED TO THE MONTANA STATE PRISON AT THE CALENDAR YEAR 1900.

Tracing No.	Percentage of Convictions Classified by Crime	Total	U. S. Court	Yellowstone	Valley	Teton	Sweet Grass	Silver Bow	Ravalli	Park	Missoula	Mcagher	Madison	Lewis and Clarke	Jefferson	Granite
1	5.06	8						1			1			1		
2	.63	1	1													
3	.63	1														
4	29.75	47		1	5		6			4				10	2	
5	.63	1														
6	.63	1														
7	.63	1														
8	8.86	14		2			3				1		1	1		
9	25.95	41		4	2	1	8			3	1	2	1	5	3	
10	1.27	2														
11	6.33	10						1					1			
12	5.06	8					1			1				1		
13	1.27	2														
14	.63	1	1													
15	2.53	4														
16	1.27	2						3		1	1			1		1
17	5.70	9		1										1		
18	.63	1														
19	1.27	2														
20	1.27	2												2		
21	100.00	158	2	8	7	1	23	23	1	9	6	2	3	22	5	1
22		343	7	17	3	8	4	56	8	21	14	2	6	56	5	1
23		501	9	25	10	8	5	79	9	30	20	4	9	78	10	2
24		58	2	2		2		5		1	11	1		10	1	
25		66		5				7	3	2	4	1	1	6	2	
26		29		2	1			7		2	2			3		
27		3						1	2							
28																
29																
30																
31		156	2	9	1	2		20	5	5	17	2	1	19	3	
32		345	7	16	9	6	5	59	4	25	3	2	8	59	7	2
33			2.03	4.64	2.61	1.74	1.45	17.10	1.16	7.24	.87	.58	2.32	17.10	2.03	.58

PENITENTIARY

STATEMENT SHOWING BY COUNTIES THE OFFENSES FOR WHICH
DEER LODGE DURING THE

CRIME OF WHICH CONVICTED	Beaverhead	Broadwater	Carbon	Cascade	Chouteau	Custer	Dawson	Deer Lodge	Fergus	Flathead	Gallatin	Granite
1 Assault	1		1		2				2	2		
2 Assisting Prisoner to Escape					1							
3 Attempted Extortion					1							
4 Bigamy					1							
5 Burglary					4	3		2	1	1	2	1
6 Forgery					4	3				1	4	
7 Grand Larceny	2		1		4	4	3	3	7	4	2	
8 Injury to Jail	3					1						
9 Kidnapping												
10 Larceny												
11 Manslaughter		1				1						
12 Mayhem						1						
13 Murder	1				1				1	1		
14 Passing Counterfeit Coin												
15 Perjury												
16 Petit Larceny—2nd Offense						1						
17 Rape					1				2		1	
18 Rec'g Stolen Property					1							
19 Robbery					1				1	1	1	
20 Stealing from U. S. Mail												
21 Total Commitments—1901	7	1	2		20	17	4	5	11	10	13	1
22 Total in Confinement, Dec. 31, 1900	3	2	5		12	29	13	4	38	11	11	5
23 Total	10	3	7		32	46	17	9	49	21	24	6
24 Discharged 1901—Expiration		1	3		4	7	2	1	11	5	5	1
25 Discharged 1901—Diminution						3			2			
26 Discharged 1901—Pardon						2						
27 Discharged 1901—Order Court						1			1			
28 Escaped						2						
29 Dier					1						1	
30 Total Discharged, Etc.		1	3		5	13	4	1	14	5	6	1
31 Total number of prisoners in confinement Dec. 31, 1901	10	2	4		27	33	13	8	35	16	18	5
32 Per cent of persons in con- finement from each county Dec. 31, 1901	2.39	.48	.95		6.44	7.88	3.10	1.91	8.35	3.82	4.30	1.19

STATISTICS

PRISONERS WERE COMMITTED TO THE MONTANA STATE PRISON AT CALENDAR YEAR 1901.

Jefferson.....	Lewis and Clarke.....	Madison.....	Meagher.....	Missoula.....	Park.....	Powell.....	Ravalli.....	Rosebud.....	Silver Bow.....	Sweet Grass.....	Teton.....	Valley.....	Yellowstone.....	U. S. Court.....	Total.....	Percentage of Convictions Classified by Crime.....	Tracing No.....
.....	1	.....	1	1	.....	.....	.....	.....	3	.....	.....	.....	1	.....	15	7.18	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.48	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.48	3
.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	1.44	4
1	3	.....	2	2	.....	.....	1	.....	16	.....	1	.....	3	.....	43	20.56	5
.....	2	.....	.....	2	1	.....	1	.....	1	1	.....	.....	1	.....	21	10.04	6
1	8	3	.....	1	2	.....	.....	.....	8	2	5	1	6	.....	70	33.48	7
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	8	3.84	8
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.48	9
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	.96	10
.....	.....	1	.....	2	1	.....	.....	.....	4	.....	.....	.....	.....	.....	10	4.78	11
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.48	12
.....	1	.....	.....	.....	.....	.....	.....	.....	4	.....	.....	1	1	.....	11	5.26	13
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.48	14
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.48	15
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.48	16
.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	6	2.87	17
.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	3	1.44	18
.....	1	.....	.....	1	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	9	4.31	19
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.48	20
4	18	4	3	9	4	.....	3	.....	42	3	6	4	13	5	2.09	100.00	21
7	59	8	2	3	25	.....	4	.....	59	5	6	9	16	7	345	.....	22
11	77	12	5	12	29	.....	7	.....	101	8	12	13	29	12	554	.....	23
3	19	.....	2	3	4	.....	.....	.....	14	.....	.....	5	7	6	103	.....	24
1	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	9	.....	25
.....	3	.....	.....	.....	.....	.....	.....	.....	3	.....	.....	1	.....	.....	9	.....	26
.....	1	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	5	.....	27
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	4	.....	28
.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	5	.....	29
4	26	.....	3	3	4	.....	.....	.....	19	.....	1	8	7	7	135	.....	30
7	51	12	2	9	25	.....	7	.....	82	8	11	5	22	5	419	.....	31
1.67	12.17	2.87	.48	2.15	5.97	.....	1.67	.....	19.57	1.91	2.63	1.19	5.25	1.18	.....	.....	32

INSANE ASYLUM

REPORT OF COMMITMENTS TO THE STATE

Tracing No.	COUNTIES	Primary Mental Deterioration	Mania	Melancholia	Primary Dementia	Secondary Dementia	Primary Confusional Insanity	Terminal Dementia	Secondary Confusional Insanity	Chronic Confusional Insanity	Primary Delusional Insanity	Secondary Delusional Insanity	Chronic Delusional Insanity	Paranoia	Epileptic
1	Beaverhead														
2	Broadwater			3							1				
3	Carbon										1				1
4	Cascade	2	1	3	4						4				
5	Choteau	1	1	2							1				
6	Custer				1										1
7	Dawson	1													
8	Deer Lodge	1	2	3	1						11			1	
9	Fergus														1
10	Flathead	2	1	1							3				
11	Gallatin		1								3				2
12	Granite	1													
13	Jefferson	1													
14	Lewis and Clarke			3							4				
15	Madison	1	1								1				
16	Meagher			1							1				
17	Missoula	1	1	1		1					3		1		
18	Park		1	2											
19	Ravalli	1													
20	Silver Bow		4	5	1						11		2		1
21	Sweet Grass			1							2				
22	Teton														
23	Valley														
24	Yellowstone	1	1								4				1
25	Blackfeet Indian Reserve														
26	Flathead Indian Reserve														
27	Ft. Peck Indian Reserve														1
28	Ft. Belknap Indian Reserve														
29	State Penitentiary														
30	U. S. Penitentiary														
31	Total committed during the year 1900, classified by disease	13	14	24	7	1					50		3	1	8
32	Total in Asylum Dec. 31, 1899 classified by disease	12	7	79	2	14		9		24	62	26	129	12	37
33	Total	25	21	103	9	15		9		24	112	26	132	13	45
34	No. discharged during 1900, classified by disease	10	3	13							28		4	1	1
35	No. escaped during 1900, classified by disease	1	1	3							6		1	1	
36	No. died during 1900, classified by disease		5	8	16	5		2		5	1	1	5	1	11
37	Total No. discharged, escaped and died, 1900	11	9	24	6	5		2		5	35	1	10	3	12
38	Total No. of patients in Asylum Dec 31, 1900, classified by disease	14	12	79	3	10		7		19	77	25	122	10	33

COMMITMENTS.

INSANE ASYLUM FOR THE YEAR 1900.

Tracing No.	Total No. in Asylum Dec. 31.	No. Escaped	No. Died	No. Discharged Improved	No. Discharged Recovered	Per cent of Patients From the Respective Counties	Total Committed During Year	Not Insane	Acute Mania	Idiocy	Imbecility	Senile Dementia	Hysterical Insanity	Paretic Dementia	Syphilitic Dementia	Alcoholic Dementia	Stuporous	Homicidal Insanity	Traumatic Insanity	Periodical Insanity
1	14	2	1	1	1	2.04	3													
2	3	2				2.72	4													
3	5	1				10.20	15				2									
4	36	1				4.08	6					1								
5	14	1																		
6	11	1				1.36	2													
7	4					1.36	2													
8	69	9				16.33	24				1									
9	10	1				1.36	2													
10	7	1				4.76	7													
11	22	2				4.76	7													
12	5					.68	1													
13	15	2				.68	1													
14	57	7				5.45	8					1								
15	9	2				2.72	4				1									
16	13	1				1.36	2													
17	44	6				7.49	11													
18	13	3				2.72	4													
19	5	1				2.04	3													
20	89	3				19.05	28					3								
21	8					2.04	3													
22	4	1																		
23	1																			
24	17	2				4.76	7													
25	2	1																		
26	1					.68	1													
27	1					.68	1													
28	1					.68	1													
29	1																			
30	2																			
31	481	15	66	19	47	100.00	147				4	1	4	1	1	1	9	5	4	
32							481				10	42	1		1	4	1	4		
33							628				14	43	5		2	4	5	9		
34							66				2	1					3			
35							15											1		
36							66				2	2	2	1	2	1		1		
37							147				4	3	5		2	2	2	2		
38							481				10	40			2	1		7		

INSANE ASYLUM

STATEMENT OF COMMITMENTS TO THE STATE INSANE

Ranking No.	COUNTIES	Primary Mental Deterioration	Mania	Melancholia	Primary Dementia	Secondary Dementia	Primary Confusional Insanity	Terminal Dementia	Secondary Confusional Insanity	Chronic Confusional Insanity	Primary Delusional Insanity	Secondary Delusional Insanity	Chronic Delusional Insanity	Paranoia	Epileptic
1	Beaverhead				1										
2	Broadwater														
3	Carbon		3		1						1				
4	Cascade			3							2		1	1	
5	Choteau										1				
6	Custer										2				
7	Dawson			1							1				
8	Deer Lodge	1		2	1						4				
9	Fergus		2									1			
10	Flathead	1	1	1	1						2		1		
11	Gallatin		1	1							1				2
12	Granite		1								4				
13	Jefferson				1						3		2		
14	Lewis and Clarke			4		1					4		4	1	1
15	Madison		1	1											
16	Meagher			1										1	
17	Missoula	1	2	1							5				
18	Park		1								4				
19	Powell			2	2						1				
20	Ravalli	1						1							1
21	Rosebud				1						2				
22	Silver Bow	2	5	2	3						9		2	1	
23	Sweet Grass	1									1				
24	Teton														
25	Valley			1											
26	Yellowstone	1	1	1			1				2				
27	Blackfeet Indian Reserve														
28	Flathead Indian Reserve														
29	Ft. Peck Indian Reserve														
30	Ft. Belknap Indian Reserve														
31	State Penitentiary														
32	United States														
33	Total committed during 1901 classified by disease	8	18	21	11	1	1	1			49	1	10	4	4
34	Total in asylum Dec. 31, 1900 classified by disease	14	12	79	3	10		7		19	77	25	122	10	33
35	Total	22	30	100	14	11	1	8		19	126	26	132	14	37
36	Number discharged 1901	10	11	14	3						31		4	1	2
37	Number escaped 1901	2			1						10		1		
38	Number died		1	3	4	1		4			4		6	1	7
39	Total discharged escaped and died, 1901	12	12	22	8	1		4			45		11	2	9
40	Total patients in Asylum Dec. 31, 1901, classified by disease	10	18	78	6	10	1	4		19	81	26	121	12	28

COMMITMENTS

ASYLUM AT WARM SPRINGS DURING THE YEAR 1901.

Tracing No.	Total Number in Asylum Dec. 31, 1901.	No. Escaped.	No. Died.	No. Discharged, Improved.	No. Discharged, Recovered.	Percentage of Commitments From Each County.	Total Committed During the Year 1901.	Not Insane.	Acute Mania.	Idiocy.	Imbecility.	Senile Dementia.	Hysterical Insanity.	Parietic Dementia.	Syphilitic Dementia.	Alcoholic Dementia.	Stuporous.	Homicidal Insanity.	Traumatic Insanity.	Periodical Insanity.
1	5					.67	1													
2	2				1															
3	7	1			1	3.36	5													
4	32	1	3	1	9	6.04	9				1	1								
5	13				2	.67	1													
6	12		1	1	1	2.68	4					2								
7	4				2	1.34	2													
8	62		6	1	10	6.71	10					1		1						
9	13		1		4	2.68	4					1								
10	11	2	1		3	6.71	10		1			2								
11	26		1		2	4.70	7					1					1			
12	7			1	1	3.36	5													
13	16		1	2	2	4.03	6													
14	61	3	4		5	12.06	18							1			2			
15	10		1		1	1.34	2													
16	13		1		1	1.34	2													
17	37	3	3		10	6.71	10					1								
18	14		3	1	1	4.03	6							1						
19	3		1		5	3.36	5													
20	5		2		1	2.02	3													
21	2			1		2.02	3													
22	86	4	11		13	17.46	26	1									1			
23	8				2	1.34	2													
24	4																			
25	1				1	.67	1													
26	16		2		5	4.70	7										1			
27																				
28	1																			
29		1																		
30				1																
31	1																			
32	2																			
33	484	15	41	16	74	100.00	149	1		1		9	1	3			5			
34							481				10	8	2	1			7			
35							630	1			10	17	3	4			12			
36							90	1				3	1				3			
37							15					1					1			
38							41			2		6		1						
39							146	1		2		10	1	1			4			
40							484			39	10	7	2	3			8			

REVENUE FROM LICENSES COLLECTED BY COUNTIES DURING THE FISCAL YEAR ENDED NOVEMBER 30, 1901.
AS REPORTED BY COUNTY TREASURERS.

COUNTIES	Assayers.....	Attorneys.....	Auctioneers.....	Bankers.....	Billiard Tables....	Brewers.....	Builders and Man- ufacturers.....	Butchers.....	Cigarette Selling..	Common Carriers..	Dentists.....	Hotels, Restaur- ants and Lodging Houses.....	Real Estate Ag- ents, Loans & Ins.	Intelligence Offices	Laundries.....	Liquor Selling at Retail.....
Beaverhead	120 00	3,159 00	240 00	2,820 00	1,985 00	3,225 00	200 00	1,793 30	3,960 00	453 50	1,460 50	9,638 15	2,820 00	170 00	4,181 50	426,925 00
Broadwater																
Carbon				80 00	37 50			42 00				70 00				3,550 00
Cascade		305 00	45 00	165 00	127 50	600 00		18 00				9 00	40 00			11,650 00
Chouteau		80 00			53 25	15 00		108 00	490 00	40 00	155 00	1,160 00	290 00		250 00	10,510 00
Cluster	3	195 00		30 00	233 50	100 00			120 00		120 00	555 00	45 00		350 00	16,550 00
DeWison		5 00		190 00	90 00			30 00	30 00		20 00	175 00			90 00	7,200 00
Iber Lodge		65 00		40 00	120 00	195 00	30 00	285 00			85 00	668 00	75 00		40 00	2,250 00
Pergus		188 50	10 00		86 25	90 00		96 30	60 00		40 50	284 50	85 00		255 00	32,750 00
Plathead			20 00	40 00	71 25	67 50		39 00			40 00	169 00	90 00		116 50	12,080 00
Gallatin		250 00	25 00		37 50	90 00		102 00	120 00		55 00	215 00	165 00		140 00	15,090 00
Granite		40 00	5 00	40 00	60 00	60 00		124 00		200 00	40 00	275 00	25 00		260 00	9,540 00
Jefferson		20 00		60 00				201 00			20 00	276 65	165 00		130 00	9,170 00
Lewis & Clarke		510 00	20 00	635 00	132 50	447 50	170 00	229 00	740 0	50 00	75 00	820 00	190 00	50 00	345 00	42,275 00
Madison		25 00		90 00	78 75	20 00		90 00			15 00	155 00				9,450 00
Meagher		30 00						12 00			35 00	80 00	65 00		40 00	4,600 00
Missoula				37 50		300 00		123 00	90 00		75 00	205 00	100 00			21,550 00
Park				60 00				60 00			60 00	90 00	125 00		60 00	12,610 00
Ravalli		20 00	5 00	52 50							35 00	185 00			120 00	7,650 00
Silver Bow	120 00	1,140 00	80 00	800 00	280 75	1,020 00			1,820 00		480 00	3,200 00	980 00	120 00	1,135 00	112,780 00
Sweet Grass		20 00	5 00		33 75			24 00				85 00	75 00		80 00	3,450 00
Teton		40 00						33 00			45 00	130 00			60 00	6,800 00
Valley		35 50		60 00				24 00			10 00	100 00				6,800 00
Yellowstone		90 00	25 00		142 50	165 00		87 00	250 00		35 00	505 00	160 00		200 00	16,470 00
Total	120 00	3,159 00	240 00	2,820 00	1,985 00	3,225 00	200 00	1,793 30	3,960 00	453 50	1,460 50	9,638 15	2,820 00	170 00	4,181 50	426,925 00
Total paid by the several businesses for the year 1895..	16 00	2,930 65	200 10	518 00	2,458 32	3,487 85	91 00	2,840 88	4,698 00	397 75	1,034 47	6,329 31	1,681 51	65 60	2,341 72	330,341 93
Inc. or dec....	104 00	228 35	39 90	2,302 00	473 32	262 85	109 00	1,047 58	738 00	55 75	126 03	3,308 84	1,138 19	104 35	1,839 78	87,583 07
Per cent of li- censes paid by each business, 1900 ....	.02	.58	.04	.51	.37	.59	.04	.33	.72	.08	.27	1.76	.52	.03	.76	77.93
Per cent of li- censes paid by each business, 1895	0.00	.62	.04	.11	.52	.74	.02	.00	1 00	.09	.22	1.32	.36	.01	.50	71.55
Inc. or dec....	.02	.04	.....	.40	.15	.15	.02	.27	.28	.01	.05	.44	.16	.02	.26	6.18

REVENUE FROM LICENSES FOR YEAR 1900—Continued.

COUNTIES	Livery, Hacks, Express, Etc.....	Merchants and Wholesale Liquor Dealers.....	Pawnbrokers and Peddlers.....	Power and Light Companies.....	Photographers....	Physicians and Surgeons.....	Street Railways...	Telegraphs and Telephones.....	Theatres.....	Water Companies.	All Others.....	Totals.....	Percent of Total Amt Licenses Pd. by Each County.	Total Licenses Collected From Each County During 1895.....	Percent of Collec- tions From Each County During 1895
Beaverhead ..	179 00	2,345 00	192 50	.....	.....	80 00	.....	.....	10 00	.....	58 00	13,650 50	2.49	12,028 36	2.51
Bradwater ..	.....	531 00	42 50	.....	.....	20 00	.....	.....	.....	.....	.....	4,265 50	.78	***	.....
Carbon ..	39 00	874 00	122 50	.....	.....	15 00	.....	.....	60 00	.....	75 00	13,025 00	2.37	4,293 69	.91
Cascade ..	818 50	7,573 50	475 00	275 00	.....	410 00	200 00	6 75	101 00	125 00	595 25	55,095 50	10.06	54,827 96	11.59
Choteau ..	150 00	1,699 00	110 00	.....	.....	130 00	.....	.....	.....	.....	15 00	20,110 25	3.67	13,255 00	2.80
Custer ..	111 00	1,935 00	12 50	.....	.....	.....	.....	.....	15 00	.....	20 00	10,187 00	1.84	11,465 18	2.42
Dawson ..	10 00	337 00	25 00	.....	.....	35 00	.....	.....	45 00	.....	35 00	3,267 00	.59	3,046 33	.77
Deer Lodge ..	461 00	4,704 00	375 00	50 00	.....	165 00	100 00	.....	256 00	100 00	375 00	41,757 50	7.62	43,272 28	9.15
Fergus ..	246 40	2,063 90	340 00	.....	.....	148 50	.....	58 50	53 00	.....	672 00	16,729 85	3.06	7,610 04	1.61
Flathead ..	72 00	1,098 00	20 00	.....	.....	55 00	.....	.....	50 00	200 00	50 00	17,302 75	3.16	13,981 00	2.95
Gallatin ..	122 00	1,872 00	127 50	50 00	.....	165 00	100 00	.....	175 00	.....	336 50	13,852 50	2.53	14,259 23	3.02
Granite ..	208 00	963 00	170 00	.....	.....	125 00	.....	.....	20 00	50 00	35 00	11,765 00	2.14	12,499 93	2.61
Jefferson ..	119 00	832 00	74 17	.....	.....	135 00	.....	22 50	45 50	.....	.....	13,570 82	2.48	20,118 73	4.25
Lewis and Clarke..	625 00	6,942 00	540 00	450 00	.....	295 00	200 00	.....	250 00	450 00	206 40	56,687 40	10.35	93,267 40	14.43
Madison ..	70 00	1,444 00	240 00	.....	.....	115 00	.....	.....	50 00	50 00	164 00	12,256 75	2.23	9,747 28	2.06
Meagher ..	40 00	525 00	180 00	.....	.....	60 00	.....	.....	24 00	.....	.....	5,691 00	1.04	9,598 22	2.03
Missoula ..	184 00	1,898 00	.....	50 00	.....	125 00	.....	.....	90 00	.....	59 00	25,696 50	4.69	23,208 25	4.91
Park ..	51 00	993 00	72 50	50 00	.....	105 00	.....	.....	.....	100 00	38 00	14,774 50	2.70	12,236 45	2.59
Ravalli ..	130 00	1,434 00	20 00	.....	.....	60 00	.....	.....	.....	50 00	25 00	9,841 50	1.80	8,510 91	1.81
Silver Bow ..	.....	16,530 00	840 00	400 00	180 00	1,600 00	200 00	.....	500 00	600 00	970 00	146,175 75	26.68	106,432 70	22.51
Sweet Grass ..	60 00	477 00	142 50	25 00	.....	10 00	.....	.....	.....	.....	56 25	4,743 50	.86	2,128 30	.45
Teton ..	55 00	1,199 00	.....	.....	.....	120 00	.....	.....	19 00	.....	20 00	8,536 00	1.56	4,857 81	.92
Valley ..	.....	512 80	50 00	.....	.....	50 00	.....	.....	8 00	.....	50 00	7,700 30	1.46	3,674 45	.78
Yellowstone ..	200 00	2,124 00	67 50	.....	.....	155 00	.....	.....	228 00	150 00	20 00	21,124 00	3.85	13,473 00	2.85
Total	3,950 90	60,936 20	4,229 17	1,350 00	500 00	4,178 50	800 00	87 75	2,872 50	1,875 00	3,875 40	547,806 37	100.00	472,942 50	100.00
Total amount paid by several busi- nesses for the year 1895	5,625 13	48,067 47	4,702 65	1,945 25	256 00	2,925 80	979 07	886 00	3,409 67	1,601 91	7,082 49	*472,942 50	.....	.....	.....
Increase or dec...	1,664 23	12,868 73	473 48	595 25	244 00	1,252 70	179 07	808 25	537 17	273 09	3,207 09	74,863 87	.....	.....	.....
Per cent of licenses paid by each busi- ness, 1900 .....	.72	11.12	.77	.25	.09	.76	.14	.02	.53	.34	.71	.....	.....	.....	.....
Per cent of licenses paid by each busi- ness, 1895	1.19	10.17	1.00	.41	.06	.62	.21	.19	.70	.34	1.50	.....	.....	.....	.....
Increase or dec...	.47	.95	.23	.16	.63	.14	.07	.17	.17	.....	.79	.....	.....	.....	.....

* Includes licenses collected in 1895 on businesses which are now prohibited by law as follows: Gambling, \$26,399.42; Olio-margarine, \$17.50; Pools on races, \$601. ** Included in merchants. *** No county in 1895. (a) Includes all professional classes.

REVENUE FROM LICENSES BY COUNTIES DURING THE FISCAL YEAR ENDED NOV. 30, 1901. AS REPORTED BY COUNTY TREASURERS.

COUNTIES	Assayers.....	Attorneys.....	Auctioneers...	Bankers	Billiard Ta- bles.....	Brewers	Builders, Man- ufacturers, Etc.....	Butchers.....	Cigarette Sell- ing.....	Common Car- riers.....	Dentists	Hotels, Res- taurants and Lodging Houses	Real Estate Agents, Loan and Insurance	Intelligence Offices	Laundries	Retail Liquor Selling.....
Beaverhead	80 00	.....	.....	112 50	60 00	.....	135 00	10 00	.....	35 00	345 00	80 00	.....	110 00	11 340 00
Broadwater	105 00	.....	120 00	105 00	.....	.....	24 00	.....	.....	5 00	85 00	.....	.....	.....	5,750 00
Carbon	160 00	45 00	135 00	.....	15 00	.....	.....	.....	10 00	65 00	.....	.....	14,145 00
Cascade	415 00	15 00	250 00	410 25	654 90	100 00	.....	460 00	.....	245 00	415 00	310 00	10 00	295 00	50,770 00
Chouteau	135 00	.....	30 00	172 25	.....	.....	120 00	120 00	159 50	70 00	622 50	65 00	.....	230 00	18,470 00
Custer	85 00	.....	10 00	296 25	100 00	.....	.....	.....	.....	20 00	190 00	190 00	.....	85 00	19,125 00
Deer Lodge	80 00	.....	410 00	90 00	.....	.....	.....	.....	.....	40 00	150 00	90 00	.....	50 00	2,850 00
Elmore	125 00	5 00	400 00	210 00	210 00	50 00	370 00	.....	37 75	105 00	600 00	135 00	10 00	295 00	33,150 00
Flathead	160 50	10 00	.....	178 50	25 00	.....	69 00	.....	.....	50 00	367 50	100 00	.....	157 00	13,715 00
Gallatin	165 00	15 00	40 00	63 75	67 50	.....	68 00	.....	.....	35 00	322 00	180 00	.....	180 00	22,980 00
Granite	265 00	30 00	.....	82 50	120 00	.....	141 00	60 00	.....	65 00	185 00	185 00	.....	250 00	29,270 00
Jefferson	140 00	.....	40 00	176 25	60 00	.....	156 00	.....	187 50	45 00	460 00	45 00	.....	130 00	10,790 00
Lewis & Clarke	170 00	.....	70 00	.....	.....	.....	201 00	.....	.....	20 00	240 00	115 00	.....	60 00	11,200 00
Madison	920 00	20 00	860 00	135 00	375 10	210 00	249 00	590 00	62 50	190 00	1,040 00	485 00	120 00	470 00	44,492 70
Mauldin	90 00	.....	315 00	105 00	60 00	.....	123 00	.....	.....	70 00	350 00	.....	.....	.....	15,300 00
McIntosh	70 00	.....	.....	.....	.....	.....	54 00	.....	.....	30 00	95 00	40 00	.....	60 00	5,640 00
Missoula	10 00	.....	45 00	150 00	.....	189 00	60 00	.....	.....	135 00	50 00	.....	.....	28,300 00
Park	65 00	.....	40 00	30 00	.....	.....	54 00	60 00	.....	50 00	90 00	80 00	.....	100 00	11,940 00
Powell	80 00	.....	80 00	7 50	55 10	.....	108 00	.....	50 00	10 00	157 00	.....	.....	30 00	6,520 00
Ravalli	45 00	5 00	.....	48 75	.....	.....	111 00	.....	29 00	55 00	200 00	15 00	.....	120 00	6,550 00
Rosebud	20 00	37 00	.....	.....	12 00	1,460 00	.....	30 00	40 00	10 00	.....	.....	1,500 00
Silver Bow	40 00	1,425 00	45 00	880 00	538 50	1,200 10	360 00	.....	.....	.....	440 00	5,415 00	1,165 00	140 00	800 00	109,500 00
Sweet Grass	35 00	.....	.....	.....	30 00	.....	.....	.....	.....	.....	10 00	115 00	.....	.....	80 00	3,300 00
Teton	55 00	.....	.....	45 00	.....	.....	42 00	.....	125 00	.....	275 00	10 00	.....	70 00	6,300 00
Valley	50 00	.....	60 00	.....	.....	.....	93 00	.....	.....	40 00	160 00	.....	.....	.....	6,660 00
Yellowstone	20 00	5 00	.....	153 75	300 00	.....	81 00	230 00	.....	55 10	430 00	125 00	.....	165 00	18,900 00
Total	75 00	4,765 50	160 00	3,785 00	3,027 75	3,602 40	720 00	2,405 00	3,450 00	642 25	1,765 00	12,544 00	3,540 00	280 00	3,677 00	479,497 70
Per cent paid by each business .....	.01	.74	.03	.59	.47	.56	.11	.38	.48	.10	.27	1.96	.55	.04	.57	71.95

REVENUE FROM LICENSES BY COUNTIES DURING THE FISCAL YEAR ENDED NOV. 30, 1901, AS REPORTED BY COUNTY TREASURERS—Continued.

COUNTIES	Livery, Hacks, Express, Etc.	Merchants, Including Liquor at Wholesale...	Pawnbrokers and Peddlers.	Pools on Races	Power and Light Companies	Photographers	Physicians and Surgeons	Street Railways	Telegraphs & Telephones.	Theaters	Water Companies.	All Others...	Total.....	Per Cent of Total Licenses Collected by Each County
Beaverhead	166 00	1,645 00	170 00	.....	50 00	10 00	190 00	.....	.....	5 00	.....	75 00	14,698 50	2.30
Broadwater	155 00	1,107 00	30 00	.....	.....	.....	60 00	.....	.....	5 00	.....	15 00	7,566 00	1.18
Carbon	96 00	1,173 90	100 00	.....	.....	5 00	20 00	.....	.....	18 00	.....	209 60	16,257 50	2.54
Cascade	933 50	6,623 00	532 50	.....	250 00	75 00	100 00	200 00	6 75	.....	150 00	1,242 57	64,373 47	10.06
Choteau	135 00	1,398 20	110 00	.....	.....	25 00	95 00	.....	.....	62 00	.....	100 00	22,109 45	3.45
Custer	258 00	1,613 00	25 00	.....	.....	30 00	120 00	.....	42 75	.....	.....	.....	13,100 00	2.05
Dawson	105 00	782 00	12 50	.....	.....	.....	50 00	.....	.....	25 00	.....	40 00	4,774 50	.75
Deer Lodge	489 00	5,716 41	350 00	.....	150 00	30 00	175 00	300 00	.....	210 00	150 00	355 00	43,658 16	6.82
Fergus	296 00	1,943 90	450 00	.....	.....	25 00	247 00	.....	69 75	106 00	.....	73 30	18,043 45	2.82
Flathead	104 00	1,333 00	110 00	.....	.....	35 00	175 00	.....	96 00	1,120 60	100 00	112 50	27,301 75	4.27
Gallatin	106 00	1,962 00	55 00	.....	50 00	35 00	210 00	100 00	.....	316 00	.....	160 00	13,647 50	2.13
Granite	270 00	1,486 00	185 00	.....	.....	15 00	155 00	.....	.....	20 00	50 00	250 00	14,060 75	2.28
Jefferson	140 00	867 00	90 00	.....	.....	.....	140 00	.....	.....	80 00	.....	128 25	13,521 25	2.11
Lewis & Clarke	648 00	6,497 50	843 50	.....	450 00	255 00	470 00	200 00	.....	245 00	450 00	597 00	60,825 20	9.51
Madison	540 00	2,833 00	280 00	.....	.....	.....	330 00	.....	.....	50 00	150 00	38 00	20,634 00	3.23
Meagher	120 00	518 00	30 00	.....	.....	.....	25 00	.....	.....	18 00	.....	.....	6,710 00	1.05
Missoula	132 00	2,550 00	93 50	.....	.....	.....	40 00	.....	.....	1,046 00	.....	104 00	32,904 50	5.14
Park	158 00	921 00	62 50	.....	25 00	5 00	135 00	.....	.....	40 00	100 00	238 00	14,193 50	2.22
Powell	103 00	567 00	77 50	.....	.....	.....	45 00	.....	.....	24 00	50 00	50 00	7,994 00	1.25
Ravalli	130 00	1,234 50	20 00	.....	.....	10 00	135 00	.....	.....	10 00	50 00	70 00	8,829 25	1.38
Rosebud	75 00	210 00	.....	.....	.....	.....	15 00	.....	15 00	5 00	.....	37 50	2,003 50	.31
Silver Bow	577 00	37,063 00	1,307 00	1,075 00	600 00	30 00	1,535 00	200 00	.....	425 00	600 00	915 50	167,756 00	26.22
Sweet Grass	80 00	531 00	.....	.....	25 00	5 00	20 00	.....	.....	45 00	.....	138 00	4,414 00	.70
Teton	226 00	816 00	55 00	.....	.....	30 00	70 00	.....	.....	18 00	.....	42 50	8,239 50	1.30
Valley	40 00	531 00	63 75	.....	.....	.....	80 00	.....	.....	.....	.....	16 00	7,793 75	1.22
Yellowstone	.....	1,637 00	75 00	.....	.....	25 00	200 00	.....	90 00	495 00	150 00	375 00	23,531 75	3.70
Total	6,082 50	83,559 41	5,127 75	1,075 00	1,600 00	645 00	4,847 00	1,000 00	330 25	4,418 00	2,000 00	5,362 72	639,604 23	100.00
Per cent paid by each business	.95	13.06	.80	.17	.25	.10	.77	.16	.05	.77	.32	.85	100.00	.....

COURT BUSINESS.
STATEMENT SHOWING BY COUNTIES AND JUDICIAL DISTRICTS THE COURT BUSINESS TRANSACTED IN MONTANA DURING THE CALENDAR YEAR 1901.

Orders of Sale.....	1 2 2 13	2 1 1 18	5 2 1 31	37 5 4 53	3 1 1 11	48 24 33 142	34 5 47 30	3 1 2 3	15 8 18 56	35 19 15 113	1 2	1 4	1 9	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1
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NATURALIZATIONS - 1900
STATEMENT SHOWING THE NUMBER AND NATIVITY OF PERSONS TO WHOM FINAL NATURALIZATION PAPERS WERE ISSUED DURING THE CALENDAR YEAR 1900, AS REPORTED BY CLERKS OF THE DISTRICT COURTS.

COUNTIES	Per Cent of Nat uralizations in Each County ..															
	Austria	Belgium.....	Bohemia.....	Canada	Cuba.....	Denmark	England	Finland.....	France.....	Germany	Ireland.....	Italy.....	Norway.....	Russia.....	Sandwich Islands.	Scotland
Beaverhead						3	4			3				1		
Broadwater						1	4									
Carbon	5	1		11		2	16	34		5			2	6	1	
Cascade	128			58		3	47	31	1	34	15	12	28	13		
Chouteau				17		2	9			18	3		3			
Custer	4			4		1	10			4			1			
Dawson	4			6			1						12			
Deer Lodge	176	5		39		2	7	7	1	12	148	14	10	4		
Fergus				10			5			7	5	2	5	1		
Flathead	2			13			3			11	4	5	9	1		
Gallatin	17			4		3	6	1		10	2	2	5	3		
Granite	5	1		14			25	7		1	3	2	3	1		
Jefferson				9			1	1		1			3	1		
Lewis & Clarke	44	2	2	34	1	9	39		2	53	13	7	17	5		
Maudsloni	1			5			3			2						
Mcagher				2		1	3			3						
Missoula	3	4		75		1	11	6		17	3	5	15	2		
Park	37			9			12		3	12	2	9	7	3		
Ravalli				4		1	1			1			1			
Silver Bow	217	4		217		16	188	130	8	58	535	163	25	14		
Sweet Grass				2			3			2			20			
Teton				12			7			3			4			
Valley	1			6		1	8			1	1			1		
Yellowstone				5		1	4			7	1					
Total	645	17	2	562	1	47	408	217	19	268	740	222	189	51	19	67
P. ct of nationalities	16.42	.43	.05	14.31	.03	1.29	10.38	5.52	.48	6.82	18.13	5.65	4.81	1.31	.27	1.71

NATURALIZATIONS—1901.
STATEMENT SHOWING BY COUNTIES THE NUMBER AND NATIVITY OF PERSONS TO WHOM NATURALIZATION PAPERS WERE ISSUED DURING THE YEAR 1901, AS REPORTED BY CLERKS OF THE DISTRICT COURTS.

COUNTIES	Per Cent of Persons Naturalized in Each County, 1900.....		Per Cent of Persons Naturalized in Each County, 1900.....		Per Cent of Persons Naturalized in Each County, 1900.....	
	Total, 1900.....	15	2.57	Total	7	2.57
Beaverhead	15	.38	2	7	2	.73
Broadwater	9	.23	11	2	1	4.04
Carbon	109	2.78	49	49	18.01	11.35
Cascade	446	11.35	19	19	6.99	1.61
Chouteau	65	1.61	8	8	2.95	1.59
Custer	59	1.59	3	3	1.10	.91
Dawson	37	.91	21	21	7.72	11.71
Deer Lodge	460	11.71	30	30	11.03	1.10
Fergus	43	1.10	14	14	5.15	1.50
Flathead	59	1.50	3	3	1.10	2.09
Gallatin	82	2.09	2	2	.73	1.91
Granite	75	1.91	1	1	.37	.66
Jefferson	26	.66	22	22	8.09	7.28
Lewis and Clarke	286	7.28	1	1	.37	.28
Madison	11	.28	3	3	1.10	.54
Meagher	21	.54	13	13	4.78	4.53
Missoula	178	4.53	4	4	1.47	2.67
Park	105	2.67	3	3	1.10	.....
Powell .....	.....	.....	6	6	2.21	.25
Ravalli	10	.25	.....	.....	.....	.....
Rosebud .....	.....	.....	29	29	10.66	43.62
Silver Bow	1,714	43.62	3	3	1.10	.81
Sweet Grass	32	.81	8	8	2.95	.81
Teton	32	.81	5	5	1.84	.64
Valley	25	.64	5	5	1.84	.76
Yellowstone	30	.76	.....	.....	.....	.....
Total	3,929	100.00	272	272	100.00	.....
All Other Countries ..	4	.....	7	7	.....	.....
Wales	3	.....	.....	.....	.....	.....
Switzerland.....	1	.....	.....	.....	.....	.....
Sweden.....	2	.....	.....	.....	.....	.....
South America .....	.....	.....	.....	.....	.....	.....
Scotland	8	.....	.....	.....	.....	.....
Sandwich Islands.....	.....	.....	.....	.....	.....	.....
Russia.....	3	.....	.....	.....	.....	.....
Norway.....	25	.....	.....	.....	.....	.....
Italy.....	7	.....	.....	.....	.....	.....
Ireland	34	.....	.....	.....	.....	.....
Germany	32	.....	.....	.....	.....	.....
France.....	1	.....	.....	.....	.....	.....
Finland.....	4	.....	.....	.....	.....	.....
England.....	31	.....	.....	.....	.....	.....
Denmark	7	.....	.....	.....	.....	.....
Cuba .....	.....	.....	.....	.....	.....	.....
Canada.....	64	.....	.....	.....	.....	.....
Bohemia.....	1	.....	.....	.....	.....	.....
Belgium.....	5	.....	.....	.....	.....	.....
Austria.....	13	.....	.....	.....	.....	.....

DIVORCES.

COMPARATIVE STATEMENT SHOWING THE NUMBER OF DIVORCES GRANTED AND MARRIAGE LICENSES ISSUED DURING THE CALENDAR YEARS 1899 AND 1900, AS REPORTED BY CLERKS OF THE DISTRICT COURTS.

COUNTIES	Granted Upon Complaint of Wife		Granted Upon Complaint of Husband		Total Number Granted		Per Cent of Divorces Granted in Each County		Marriage Licenses Issued During the Year		Per Cent of Divorces Granted to Licenses Issued	
	1899	1900	1899	1900	1899	1900	1899	1900	1899	1900	1899	1900
Beaverhead	6	2	1	2	7	4	2.08	1.13	36	55	19.44	7.27
Broadwater	1	3	1	1	2	4	.60	1.13	15	13	13.33	30.77
Carbon	12	12	4	1	16	13	4.76	3.66	65	80	24.61	16.25
Cascade	22	26	5	7	27	33	8.04	9.30	229	221	11.80	14.93
Choteau	7	5	1	3	8	8	2.38	2.25	73	56	10.96	14.29
Custer	6	8	3	1	9	9	2.68	2.54	56	51	16.07	17.65
Dawson	1	1	.....	4	1	5	.30	1.41	18	21	5.55	23.81
Deer Lodge	26	15	7	4	33	19	9.82	5.35	148	146	22.30	13.01
Fergus	3	9	2	1	5	10	1.49	2.82	55	43	9.09	23.26
Flathead	5	11	7	6	12	17	3.57	4.79	80	76	15.00	22.37
Gallatin	4	3	2	3	6	6	1.79	1.69	84	79	7.14	7.59
Granite .....	.....	3	1	1	1	4	.30	1.13	24	26	4.17	15.38
Jefferson	3	2	2	2	5	4	1.49	1.13	26	16	19.23	15.38
Lewis and Clarke	36	33	9	10	45	43	13.39	12.11	186	201	34.20	21.39
Madison	7	3	.....	3	7	6	2.08	1.69	36	36	19.44	16.66
Meagher	1	2	3	1	4	3	1.19	.85	11	14	16.36	21.43
Missoula	12	14	4	6	16	20	4.76	5.64	109	146	14.68	13.70
Park	6	14	2	3	8	17	2.38	4.76	81	67	9.88	25.37
Ravalli	5	4	2	2	7	6	2.08	1.69	52	58	13.46	10.34
Silver Bow	70	74	23	15	93	89	27.68	25.07	529	610	17.58	14.59
Sweet Grass	4	2	.....	1	4	3	.60	.85	23	22	8.70	13.64
Teton	2	4	1	4	3	8	.89	2.25	31	21	9.07	38.10
Valley .....	.....	5	2	0	2	5	.60	1.41	20	37	10.00	13.51
Yellowstone	13	14	4	5	17	19	5.05	5.35	86	89	19.77	21.35
Totals	252	269	86	86	338	355	100.00	100.00	2,073	2,194	16.21	16.18
Per cent	75.00	75.77	25.00	24.23	100.00	100.00	.....	.....	.....	.....	.....	.....

DIVORCES.

COMPARATIVE STATEMENT SHOWING THE NUMBER OF DIVORCES GRANTED AND MARRIAGE LICENSES ISSUED DURING THE CALENDAR YEARS 1900 AND 1901, REPORTED BY CLERKS OF THE DISTRICT COURTS.

COUNTIES	Granted Upon Complaint of Wife		Granted Upon Complaint of Husband		Total Number Granted		Percentage of Divorces Granted in the Several Counties		Marriage Licenses Issued During the Year		Percentage of Divorces Granted to Licenses Issued in Each County	
	1900	1901	1900	1901	1900	1901	1900	1901	1900	1901	1900	1901
Beaverhead	2	2	2	1	4	3	1.13	.67	55	51	7.27	5.98
Broadwater	3	2	1	1	4	3	1.13	.67	13	16	30.77	18.75
Carbon	12	2	1	2	13	4	3.66	.90	80	64	16.25	6.25
Cascade	26	35	7	12	33	47	9.30	10.54	221	279	14.93	16.85
Dawson	5	10	3	4	8	14	2.25	3.14	56	72	14.29	19.44
Custer	8	7	1	2	9	9	2.54	2.02	51	38	17.65	23.68
Choteau	1	5	4	2	5	7	1.41	1.57	21	23	23.81	30.43
Deer Lodge	15	20	4	12	19	32	5.35	7.18	146	127	13.01	25.20
Fergus	9	8	1	1	10	9	2.82	2.02	43	32	23.26	10.97
Flathead	11	14	6	7	17	21	4.79	4.71	76	107	22.37	19.63
Gallatin	3	10	3	3	6	13	1.69	2.92	79	102	7.95	12.74
Granite	3	7	1	2	4	9	1.13	2.02	26	27	15.38	33.33
Jefferson	2	6	2	0	4	6	1.13	1.34	26	16	15.38	37.50
Lewis and Clarke	33	29	10	6	43	35	12.11	7.85	201	217	21.39	16.13
Madison	3	2	3	2	6	4	1.69	.90	36	39	16.66	11.11
Missoula	2	2	1	1	3	3	.85	.67	14	14	21.43	21.43
Meagher	14	22	6	7	20	29	5.64	6.50	146	152	13.70	19.08
Park	14	11	3	6	17	17	4.76	3.81	67	79	25.37	21.52
Powell .....	.....	3	.....	0	.....	3	.....	.67	.....	29	.....	10.34
Ravalli	4	7	2	2	6	9	1.69	2.02	58	52	10.34	17.31
Rosebud .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Bow	74	92	15	50	89	142	25.07	31.84	610	637	14.59	22.29
Sweet Grass	2	1	1	2	3	3	.85	.67	22	18	13.64	16.66
Teton	4	6	4	0	8	6	2.25	1.34	21	22	38.10	27.28
Valley	5	1	0	0	5	1	1.41	.22	37	42	13.51	2.38
Yellowstone	14	11	5	6	19	17	5.35	3.81	89	105	21.35	16.19
Totals	269	315	86	131	355	446	.....	.....	2,194	2,305	.....	.....
Per cent	75.77	70.63	24.23	29.37	100.00	100.00	100.00	100.00	.....	.....	16.18	19.35

JAIL INCARCERATIONS 1900

COUNTIES	WHITE			COLORED			INDIANS, HALF B'DS, CHINESE & JAPANESE			Total Confined During Yr.	DAYS CONFINED		OFFENSES CHARGED		Witnesses' Held.....	Insane Temporarily in Custody of Sheriff.....	Percent Incarcerations for Each County to Total In- carcerations in State, 1900
	Male.....	Female	Total	Male.....	Female.....	Total.....	Male.....	Female.....	Total		Total No. Days All Confined.....	Average No. Days Each Confined.....	Misdemeanors	Felonies Held Over For Action District Court			
Placerhead	38	2	40	.....	.....	.....	.....	.....	.....	40	892	22.3	35	3	.....	2	.63
Broadwater	9	2	11	.....	.....	.....	.....	.....	.....	11	438	39.8	2	4	.....	5	.17
Carbon	16	.....	16	.....	.....	.....	.....	.....	.....	17	374	22.0	12	4	.....	1	.27
Cascade	199	22	221	.....	.....	.....	.....	.....	.....	221	7,091	32.1	183	22	.....	16	3.51
Chocoma	118	4	122	.....	.....	.....	.....	.....	.....	133	4,428	33.3	83	40	.....	9	2.11
Custer	36	4	40	.....	.....	.....	.....	.....	.....	43	546	12.7	43	.....	.....	6	.68
Dawson	14	.....	14	.....	.....	.....	.....	.....	.....	14	231	16.5	5	.....	.....	2	.22
Deer Lodge	518	21	539	.....	.....	.....	.....	.....	.....	397	11,629	29.0	311	51	.....	27	6.30
Fergus	61	.....	61	.....	.....	.....	.....	.....	.....	74	1,276	17.2	57	15	.....	2	1.18
Flathead	585	7	592	.....	.....	.....	.....	.....	.....	668	10,020	15.0	651	10	.....	4	10.60
Gallatin	25	3	28	.....	.....	.....	.....	.....	.....	30	352	11.7	15	4	.....	11	.48
Granite	41	2	43	.....	.....	.....	.....	.....	.....	44	1,003	22.8	38	2	.....	4	.70
Jefferson	123	.....	123	.....	.....	.....	.....	.....	.....	124	1,367	11.0	111	10	.....	3	1.97
Lewis and Clarke	274	16	290	.....	.....	.....	.....	.....	.....	308	7,542	24.5	200	90	.....	14	4.89
Madison	18	.....	18	.....	.....	.....	.....	.....	.....	22	545	24.8	5	12	.....	5	.35
Meagher	12	.....	12	.....	.....	.....	.....	.....	.....	12	391	32.6	10	.....	.....	2	.19
Missoula	665	19	684	.....	.....	.....	.....	.....	.....	725	6,862	9.5	700	13	.....	12	11.51
Park	300	2	302	.....	.....	.....	.....	.....	.....	304	3,050	10.0	273	27	.....	4	4.83
Ravalli	124	2	126	.....	.....	.....	.....	.....	.....	128	825	6.4	123	3	.....	1	2.03
Silver Bow	2,663	162	2,825	.....	.....	.....	.....	.....	.....	2,845	20,779	7.3	1,491	1,254	.....	58	45.17
Sweet Grass	6	.....	6	.....	.....	.....	.....	.....	.....	6	98	16.3	5	1	.....	.....	.10
Teton	15	.....	15	.....	.....	.....	.....	.....	.....	15	103	6.9	15	.....	.....	.....	.4
Valley	38	1	39	.....	.....	.....	.....	.....	.....	40	1,473	36.8	11	27	.....	.....	.6
Yellowstone	72	.....	72	.....	.....	.....	.....	.....	.....	78	2,135	27.4	57	11	.....	10	1.24
Total	5,800	269	6,069	.....	.....	.....	.....	.....	.....	6,299	83,450	13.25	4,436	1,612	.....	192	100.00
Totals for 1899.....	3,930	303	4,233	.....	.....	.....	.....	.....	.....	4,573	85,386	18.59	3,561	612	.....	253	.....
Increase or decrease	1,870	34	1,836	.....	.....	.....	.....	.....	.....	1,746	1,936	.....	.....	.....	.....	61	.....
Per cent of total incar- cerations, 1900	92.08	4.27	96.35	1.51	.40	1.91	1.65	.09	1.74	.....	.....	.....	.....	.....	.....	.....	.....

Per cent of increase of total incarcerations over the year 1899: 27.08.
1-2 Chinese, 2-15 Japanese and 17 Chinese, 3-4 Chinese, 4-1 Chinese.

JAIL INCARCERATIONS—1901

COUNTIES	WHITE			COLORED			INDIANS			Total Confined During Yr	Total No. Days All Con- fined	Average No. Days Each Confined	Misdemeanors.....	Felonies Held Over for Action of District Court.	Witnesses Held.....	Insane Temporarily in Custody of Sheriff.....	Percent Incarcerations of Each County to Total In- carcerations in State, 1901
	Male.....	Female.....	Total.....	Male.....	Female.....	Total.....	Male.....	Female.....	Total.....								
Peaverhead	81	1	82	8	2	10	.....	.....	.....	92	2,518	27.4	69	14	3	6	1.87
Broadwater	3	.....	3	.....	.....	.....	.....	.....	.....	3	47	15.6	.....	3	.....	.....	.06
Carbon	11	.....	11	.....	.....	.....	.....	.....	.....	11	265	2.4	5	4	2	.....	.22
Cascade	226	10	236	12	9	21	.....	.....	.....	257	6,127	.....	215	30	5	7	5.22
Choteau	57	1	58	4	.....	4	.....	.....	.....	6	2,303	34.9	40	19	.....	.....	1.34
Custer	139	5	144	.....	.....	.....	.....	.....	.....	114	2,011	14.0	141	3	.....	.....	2.92
Lawson	63	4	67	.....	.....	.....	.....	.....	.....	63	507	7.5	61	5	.....	.....	1.38
Deer Lodge	310	16	326	12	5	17	.....	.....	.....	345	9,604	28.0	278	42	7	18	7.00
Pergus	112	1	113	1	.....	1	.....	.....	.....	121	1,447	12.0	85	31	.....	.....	2.46
Flathead	161	19	180	20	1	21	6	5	51	252	3,024	12.0	224	19	2	7	5.12
Gallatin	65	2	67	1	.....	1	.....	.....	.....	68	1,024	15.1	48	11	1	8	1.38
Granite	45	2	47	1	1	2	.....	.....	.....	49	732	15.0	33	9	3	4	1.00
Jefferson	114	.....	114	.....	.....	.....	.....	.....	.....	114	1,371	12.0	98	12	.....	.....	2.32
Lewis and Clarke	209	14	223	17	3	20	16	1	17	269	19,270	.74	138	84	12	25	5.28
Madison	31	.....	31	.....	.....	.....	.....	.....	.....	31	686	22.1	15	13	.....	3	.63
Meagher	12	3	15	.....	.....	.....	.....	.....	.....	15	193	12.9	11	3	.....	1	.31
Missoula	1,066	32	1,098	8	3	11	19	11	30	1,139	7,605	6.7	1,094	23	5	17	3.12
Park	279	11	290	.....	.....	.....	.....	.....	.....	290	2,747	9.5	280	4	1	5	5.89
Powell	68	.....	68	.....	.....	.....	4	.....	.....	72	1,183	16.4	60	8	.....	4	1.46
Ravalli	62	1	63	2	.....	2	.....	.....	.....	65	925	14.2	62	3	.....	.....	1.32
Rosebud	27	1	28	.....	.....	.....	2	.....	.....	39	386	12.8	23	4	1	2	.61
Silver Bow	1,084	110	1,194	24	15	39	1	.....	.....	1,234	18,325	15.0	558	423	183	70	25.0
Sweet Grass	38	.....	38	4	.....	4	6	.....	.....	44	590	13.4	37	5	.....	.....	.89
Teton	16	.....	16	1	.....	1	3	1	4	21	1,047	49.9	9	12	.....	.....	.43
Valley	28	.....	28	.....	.....	.....	11	1	12	40	1,556	38.9	26	14	.....	.....	.81
Yellowstone	73	8	86	1	2	3	5	.....	.....	94	2,452	26.1	65	23	.....	6	1.91
Total	4,385	241	4,626	114	41	155	125	19	144	4,925	88,035	17.9	3,675	821	225	204	100.0

* Chinese. 1—12 Chinese. 2—2 Chinese. 3—4 Chinese. 4—1 Mexican. 5—1 Chinese. 6—12 Chinese; 26 Japs. 7—1 Chi-
nese; 4 Japs.

COUNTY INDEBTEDNESS 1900.

STATEMENT OF COUNTY INDEBTEDNESS FOR THE FISCAL YEAR ENDED NOVEMBER 30, 1900; ALSO SHOWING THE INCREASE OR DECREASE AS COMPARED WITH THE FORMER YEAR, AND ASSESSED VALUATION.

COUNTIES	Amount of Outstand- ing Bonds	Rate of Interest	Amount of Outstand- ing War- rants	Total Gross Indebt- edness	Cash on Hand	Total Net Indebted- ness	Increase or Decrease as Compared With the Fiscal Year Ended Nov. 30, 1899		Assessed Valuation
							Increase	Decrease	
Beaverhead	80,000 00	4	28,815 28	108,815 28	50,951 29	57,863 99	.....	549 97	4,046,557
Broadwater	62,000 00	6	28,136 13	90,136 13	33,152 90	56,983 23	.....	6,156 12	1,943,953
Carbon	57,000 00	6	.....	.....	.....	.....	.....	.....	.....
Carbon	45,000 00	5	1,923 00	103,923 00	32,453 87	71,469 22	9,307 64	.....	2,674,641
Cascade	225,943 19	6	.....	.....	.....	.....	.....	.....	.....
Cascade	135,776 00	7	18,441 95	380,161 14	139,513 91	240,647 24	.....	4,690 75	13,122,781
Chouteau	200,000 00	6	5,981 94	205,981 94	107,110 25	98,871 69	.....	9,006 12	6,314,203
Custer	274,000 00	6	7,705 89	281,705 89	122,252 61	159,453 28	.....	14,111 60	6,681,794
Dawson	89,000 00	6	.....	.....	.....	.....	.....	.....	.....
Dawson	11,000 00	7	18,702 56	118,702 56	73,954 82	44,747 74	.....	17,582 18	259,249
Deer Lodge	250,000 00	5	119,726 15	369,726 15	111,296 48	258,429 67	41,439 07	.....	8,001,934
Fergus	103,000 00	6	3,390 06	106,390 06	79,338 42	27,051 64	.....	2,691 84	5,338,871
Flathead	100,000 00	6	.....	.....	.....	.....	.....	.....	.....
Flathead	40,000 00	4	63,874 84	203,874 84	61,557 62	142,317 22	57,721 33	.....	4,149,564
Gallatin	95,000 00	6	1,405 44	233,405 44	94,320 46	139,084 98	.....	8,192 09	6,563,143
Gallatin	137,000 00	4½	134,118 56	134,118 56	31,117 66	103,000 90	.....	359 00	2,130,215
Granite .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jefferson	50,000 00	6	.....	.....	.....	.....	.....	.....	.....
Jefferson	75,000 00	4½	234 71	125,234 71	42,407 03	82,827 68	.....	8,871 25	3,671,336
Lewis and Clarke	100,000 00	5½	18,671 40	208,671 40	84,126 77	124,544 63	.....	19,389 85	15,243,845
Madison	100,000 00	5½	2,658 22	102,658 22	38,575 28	64,082 94	539 21	.....	4,000,406
Meagher	138,000 00	6	.....	.....	.....	.....	.....	.....	.....
Meagher	50,000 00	7	3,462 88	191,462 88	129,359 72	62,103 16	.....	29,303 78	3,319,805
Missoula	190,000 00	6	.....	.....	.....	.....	.....	.....	.....
Missoula	63,000 00	7	.....	.....	.....	.....	.....	.....	.....
Missoula	100 00	5	149,511 08	402,611 08	101,717 40	297,893 68	.....	14,200 55	7,547,860
Park	120,000 00	6	.....	.....	.....	.....	.....	.....	.....
Park	80,000 00	7	689 61	200,689 61	44,566 45	156,123 16	.....	8,051 91	3,840,890
Ravalli	75,000 00	6	.....	.....	.....	.....	.....	.....	.....
Ravalli	20,000 00	5	36,625 99	131,625 99	39,320 78	92,305 21	14,112 12	.....	2,924,071
Silver Bow	125,000 00	5	1,370 44	126,370 44	203,781 87	*137,411 43	.....	9,445 33	36,204,641
Sweet Grass	95,000 00	6	2,415 22	97,415 22	37,069 39	60,345 83	.....	1,439 62	2,628,167
Teton	60,000 00	6	19,669 10	79,669 10	42,464 63	37,204 47	.....	10,461 01	2,890,038
Valley	67,000 00	7	24,148 13	91,148 13	36,351 71	54,796 42	.....	4,783 53	2,222,688
Yellowstone	19,000 00	6	.....	.....	.....	.....	.....	.....	.....
Yellowstone	91,500 00	5	14,091 97	164,591 97	75,467 17	89,124 80	.....	3,088 18	5,117,549
Totals	3,553,319 19	.....	705,770 64	4,259,089 83	1,875,128 48	2,383,961 35	123,110 37	164,073 08	153,468,577

* Surplus.

COUNTY INDEBTEDNESS—1901.

STATEMENT OF COUNTY INDEBTEDNESS FOR THE FISCAL YEAR ENDED NOVEMBER 30, 1901; ALSO SHOWING THE INCREASE OR DECREASE AS COMPARED WITH THE FORMER YEAR, AND THE ASSESSED VALUATION.

COUNTIES	Amount of Outstanding Bonds	Rate of Interest, Percent	Amount of Outstanding Warrants	Total Gross Indebtedness	Cash on Hand	Total Net Indebtedness	Increase or Decrease as Compared With the Fiscal Year Ending Nov. 30, 1900		Assessed Valuation
							Increase	Decrease	
Beaverhead	20,000 00	5	34,587 42	114,587 42	48,554 77	66,032 65	8,178 64	.....	4,122,649
Beaverhead	60,000 00	4	37,670 69	99,670 69	27,545 32	72,125 37	15,142 64	.....	2,001,827
Broadwater	62,000 00	6	.....	.....	.....	.....	.....	.....	.....
Carbon	57,000 00	6	.....	.....	.....	.....	.....	.....	.....
Carbon	45,000 00	5	23,348 12	125,348 12	43,199 94	82,148 18	.....	49,742 31	8,027,195
Cascade	50,000 00	3½	.....	.....	.....	.....	.....	.....	.....
Cascade	210,000 00	6	12,186 59	572,186 59	295,372 78	276,813 81	36,163 57	.....	14,227,265
Cascade	300,000 00	4	.....	.....	.....	.....	.....	.....	.....
Choteau	200,000 00	6	5,430 07	205,430 07	135,608 35	69,821 72	.....	29,049 97	6,818,739
Custer	274,000 00	6	7,475 88	281,475 88	167,649 88	113,776 00	.....	45,677 28	4,139,530
Dawson	89,000 00	6	.....	.....	.....	.....	.....	.....	.....
Dawson	11,000 00	5	4,167 42	104,167 42	49,357 55	54,809 87	17,388 52	.....	2,943,952
Deer Lodge	190,000 00	5	109,523 24	299,523 24	96,837 70	202,685 54	.....	53,456 27	6,085,685
Fergus	103,000 00	6	3,435 60	106,435 60	86,846 49	19,589 11	.....	7,462 53	5,952,711
Flathead	40,000 00	4	.....	.....	.....	.....	.....	.....	.....
Flathead	100,000 00	6	42,182 70	182,182 70	71,151 53	111,031 17	.....	31,286 05	4,962,289
Gallatin	35,000 00	6	.....	.....	.....	.....	.....	.....	.....
Gallatin	137,000 00	4½	.....	.....	.....	.....	.....	.....	.....
Gallatin	90,000 00	4	459 74	262,459 74	77,699 86	184,759 88	45,674 91	.....	6,787,827
Granite .....	.....	.....	123,607 79	123,067 79	43,929 01	79,138 78	.....	16,933 67	2,218,349
Jefferson	75,000 00	4½	.....	.....	.....	.....	.....	.....	.....
Jefferson	50,000 00	6	174 10	125,174 10	56,591 30	68,582 80	.....	14,244 88	2,871,779
Lewis and Clarke	180,000 00	5½	12,537 64	192,537 64	97,647 16	94,890 48	.....	29,654 15	15,657,003
Madison	100,000 00	4½	2,481 61	102,481 61	45,410 95	57,070 66	.....	7,012 28	4,520,511
Meagher	33,000 00	7	.....	.....	.....	.....	.....	.....	.....
Meagher	55,000 00	6	2,446 53	90,446 53	70,248 67	20,197 86	.....	41,905 30	3,385,811

COUNTY INDEBTEDNESS—1901.

STATEMENT OF COUNTY INDEBTEDNESS FOR THE YEAR ENDING NOV. 30, 1901—Continued.

COUNTIES	Amount of Outstanding Bonds	Rate of Interest, Percent	Amount of Outstanding Warrants	Total Gross Indebtedness	Cash on Hand	Total Net Indebted- ness	Increase or Decrease as Compared With the Fiscal Year Ending Nov. 30, 1900		Assessed Valuation
							Increase	Decrease	
Missoula	13,000 00	7							
Missoula	190,000 00	6							
Missoula	100 00	5	153,731 44	376,831 44	94,297 64	282,533 80	.....	15,359 88	8,145,900
Park	20,000 00	4							
Park	80,000 00	7	478 33	200,478 33	54,820 41	145,657 92	.....	10,465 26	4,124,575
Park	120,000 00	6	26,743 94	101,743 94	41,184 03	60,559 91	60,559 91	.....	2,845,371
Powell	75,000 00	4							
Powell	75,000 00	6							
Ravalli	20,000 00	5	39,452 58	134,452 58	36,223 74	98,228 84	5,934 63	.....	3,033,274
Rosebud .....	.....	.....	79,018 29	79,018 29	35,818 26	43,200 03	43,200 03	.....	1,924,430
Silver Bow	125,000 00	5	832 50	125,832 50	226,782 12 *	100,949 62	.....	27,804 99	39,324,300
Sweet Grass	95,000 00	6	2,457 32	97,457 32	34,701 26	62,756 06	2,410 23	.....	2,747,783
Teton	60,000 00	6	14,109 29	74,109 29	41,571 29	32,538 00	.....	4,659 15	3,035,482
Valley .....	.....	5½	30,805 35	30,805 35	38,703 91	*7,898 56	.....	12,052 51	2,641,149
Yellowstone	91,500 00	5							
Yellowstone	45,000 00	4	14,821 09	151,321 19	67,099 04	84,222 05	.....	3,902 75	5,820,294
Total	3,575,600 00	.....	783,625 27	4,359,225 27	2,084,902 93	2,383,170 49	234,643 08	400,689 23	168,347,619

* Surplus.

COUNTY INDEBTEDNESS--1902.

STATEMENT OF COUNTY INDEBTEDNESS FOR THE FISCAL YEAR ENDED NOVEMBER 30, 1902; ALSO SHOWING THE INCREASE OR DECREASE AS COMPARED WITH THE FORMER YEAR, AND THE ASSESSED VALUATION.

COUNTIES	Amount of Outstanding Bonds	Rate of Interest Per Cent	Amount of Outstanding Warrants	Total Gross Indebted- ness	Cash on Hand	Total Net Indebted- ness	Increase or Decrease as Compared With the Fiscal Year Ended Nov. 30, 1901		Assessed Valuation
							Increase	Decrease	
Beaverhead	60,000 00	4	26,082 78	106,082 78	46,166 99	59,915 79	.....	6,116 86	4,879,059
Beaverhead	20,000 00	5	35,179 15	97,179 15	32,506 67	64,673 48	.....	7,551 89	2,363,420
Broadwater	62,000 00	6	.....	.....	.....	.....	.....	.....	.....
Carbon	57,000 00	6	.....	.....	.....	.....	.....	.....	.....
Carbon	45,000 00	5	17,411 59	119,411 59	47,470 11	71,941 48	.....	10,206 70	3,260,461
Cascade	210,000 00	6	22,720 59	582,720 59	161,832 27	420,888 32	141,074 51	.....	15,626,504
Cascade	300,000 00	4	.....	.....	.....	.....	.....	.....	.....
Cascade	50,000 00	3½	.....	.....	.....	.....	.....	.....	.....
Choteau	200,000 00	6	6,405 89	206,405 89	193,578 72	12,827 17	.....	56,994 55	9,465,675
Custer	274,000 00	6	7,073 18	281,073 18	178,260 56	102,812 62	.....	10,963 38	5,836,976
Dawson	89,000 00	6	3,423 37	103,423 37	42,274 33	61,149 04	11,791 49	.....	3,972,845
Dawson	11,000 00	5	.....	.....	.....	.....	.....	.....	.....
Deer Lodge	180,000 00	5	70,276 52	250,276 52	68,656 35	181,620 17	.....	21,065 37	7,572,432
Fergus	53,000 00	6	3,686 67	106,686 67	103,197 62	3,489 05	.....	16,100 06	6,632,831
Fergus	50,000 00	4¼	.....	.....	.....	.....	.....	.....	.....
Flathead	100,000 00	6	84,810 55	239,810 55	85,019 97	154,790 58	42,752 03	.....	7,316,893
Flathead	55,000 00	4	.....	.....	.....	.....	.....	.....	.....
Gallatin	35,000 00	6	974 26	262,974 26	72,922 61	190,051 65	5,291 77	.....	7,937,751
Gallatin	137,000 00	4½	.....	.....	.....	.....	.....	.....	.....
Gallatin	90,000 00	4	.....	.....	.....	.....	.....	.....	.....
Granite .....	.....	.....	104,940 69	104,940 69	48,393 04	56,547 65	.....	22,591 13	2,369,369
Jefferson	75,000 00	4½	304 61	75,304 61	31,507 45	43,797 16	.....	24,785 64	4,212,583
Lewis and Clarke	170,000 00	5½	3,112 82	173,112 82	78,915 88	94,196 94	.....	693 54	17,141,462
Madison	100,000 00	4½	2,265 94	102,265 94	55,947 83	46,318 11	.....	10,752 55	5,138,323
Meagher	55,000 00	6	1,503 53	56,503 53	32,537 74	23,965 79	3,767 93	.....	3,687,770
Missoula	190,000 00	6	.....	.....	.....	.....	.....	.....	.....
Missoula	13,000 00	7	176,724 44	379,824 44	122,062 74	257,761 70	.....	24,772 10	10,368,909
Missoula	100 00	5	.....	.....	.....	.....	.....	.....	.....
Park	120,000 00	6	.....	.....	.....	.....	.....	.....	.....
Park	80,000 00	7	39 23	200,039 23	71,415 07	128,624 16	.....	17,033 76	4,897,603
Powell	75,000 00	4	31,286 18	106,286 18	48,965 14	57,321 04	.....	3,237 87	3,336,809
Ravalli	75,000 00	6	.....	.....	.....	.....	.....	.....	.....
Ravalli	18,000 00	5	36,335 15	129,335 15	32,571 54	96,763 61	.....	1,406 23	3,641,950
Rosebud	45,000 00	6	28,271 28	73,271 28	35,139 40	38,131 88	.....	5,008 15	4,050,130
Silver Bow	125,000 00	5	9,649 68	134,649 68	245,809 38	111,159 70	.....	.....	32,560,000
Sweet Grass	95,000 00	6	2,453 44	97,453 44	42,501 88	54,951 56	.....	7,804 50	3,334,859
Teton	60,000 00	6	2,554 22	62,554 22	46,655 55	15,898 66	.....	16,639 34	4,295,900
Valley .....	.....	.....	53,878 84	53,878 84	58,610 24	4,731 40	.....	4,629 96	4,434,552
Yellowstone	91,500 00	5	11,999 11	149,499 11	82,585 64	65,913 47	.....	18,308 28	7,480,218
Yellowstone	45,000 00	4	.....	.....	.....	.....	.....	.....	.....
Totals	3,510,600 00	.....	743,363 71	4,253,963 71	2,065,503 73	2,188,459 98	207,677 73	286,781 86	185,725,651

CITY INDEBTEDNESS.

STATEMENT OF INDEBTEDNESS OF THE INCORPORATED CITIES OF MONTANA, AS REPORTED BY CITY CLERKS AT THE EXPIRATION OF THE LAST FISCAL YEAR.

NAME OF CITY	Fiscal Year Ends	Year in Which Bonds Were Issued	Amount	Rate of Interest	No. of Years to Run	Purpose for Which Issued	Floating Indebtedness	Amount of Bonds Paid
Anaconda	April 30	1887	25,000 00	6	10-20	Sewer	None	6,000 00
		1895	34,000 00	6		City Hall		
Billings	April 30	1896	25,000 00	6	20	Grad. & Imp. Sts.	None	3,000 00
		1902	22,000 00	4 1/2	20	Build. City Hall		
Bozeman	April 30	1892	3,000 00	6	20	Dump Ground	21,658 39	
		1898	7,000 00	5	20	City Hall Fund		
		1899	165,000 00	5	20	Water Works		
		1901	30,000 00	4	20	City Hall Fund		
Butte	May 1	1890	50,000 00	6	10-20	For Sewers	344,348 35	
		1890	20,000 00	6	10-20	Build. City Hall		10,000 00
		1892	50,000 00	6	10-20	Pub. Lib. Build.		
Deer Lodge	May 1	None					8,000 00	
Dillon	Nov. 30	None					None	
Fort Benton	1st Monday of May	1893	12,500 00	7	10-20	Pur. Water Plant	None	
	May 1	1891	41,000 00	6	10-20	Funding	22,843 00	
		1891	40,000 00	6	10-20	Park		
		1892	30,000 00	6	10-20	Sewer		
		1892	30,000 00	6	10-20	Funding		
Great Falls		1898	125,000 00	5	10	Water Bonds		
		1898	125,000 00	5	15	Water		
		1898	125,000 00	5	20	Water		
		1900	25,000 00	5	10-20	Main Sewer		
Hamilton	May 31	None					None	
Havre	March 1	1902	10,000 00	6	10-20	Sewer	None	
	1st Monday in May	1899	150,000 00	5	20	Sewer		
		1891	75,000 00	6	20	Funding		
Helena		1896	187,000 00	6	20	Funding		
		1899	65,000 00	4	20	Refunding		
Kalispell	May 1	1895	20,000 00	6	10-20	Sewer	2,500 00	
Lewistown	April 30	1902	50,000 00	5	20	Water and Sewer	213,25	
Livingston	April 30	1896	10,000 00	6	10-20	City Hall	2,000 00	
Miles City	April 30	1896	17,000 00	6	10-20	Water and Light	4,329 87	
Missoula	1st Monday in May	1891	38,000 00	6	10-20	Sewer	38,000 00	
		1891	55,000 00	6	10-20	Bridge		
Neihart	April 30	None						
Phillipsburg	May 1	1902	30,000 00	6	20	Water	5,000 00	
Red Lodge	1st Monday in May	1899	25,000 00	5	10-20	Water	None	
		1900	10,000 00	5	10-20	Water		
Townsend	May 1	None					2,500 00	
Virginia City	1st Tues. in Feb.	1896	10,000 00	6	20	City Hall	None	3,500 00
White Sulphur Springs	1st Monday in May	1897	30,000 00	6	10-20	Water	None	5,000 00
Total			1,821,500 00				458,002 86	27,500 00

STATE LANDS UNDER LEASE.

TABLE SHOWING THE NUMBER OF ACRES IN EACH LAND GRANT AND THE RENTALS RECEIVED THERE-
FROM, BY COUNTIES, DURING 1902.

No.	COUNTY	School	Univ.	P. B.	S. of M.	S. N. S.	Ag. Col. B'd	Ag. Col. Inc.	Ch. Ref. S.	D. & D.	Sol. Ho.	Tot'l Acres	Rentals	Av. per acres.
1	Beaverhead ..	57,066 17	.....	5,020 00	11,725 83	10,419 53	.....	8,783 46	5,650 00	5,560 00	.....	110,254.99	\$9,962 65	09.6
2	Broadwater ..	10,026 92	480 00	3,899 89	.....	.....	.....	.....	.....	.....	.....	14,406.81	2,043 37	14.2
3	Carbon	22,255 02	.....	.....	.....	.....	.....	1,100 00	1,683 63	.....	.....	25,038.05	3,071 70	12.2
4	Cascade ..	126,845 26	1,428 43	400 00	9,745 19	5,593 52	.....	1,720 00	3,178 47	.....	.....	148,910.87	18,277 35	12.3
5	Choteau	265,668 23	.....	5,941 22	25,388 09	10,669 03	.....	18,070 40	670 14	.....	.....	326,407.11	36,358 27	11.1
6	Custer ..	44,743 15	1,600 00	.....	.....	.....	.....	.....	.....	.....	.....	46,343.15	3,722 75	08.0
7	Dawson ..	11,504 10	.....	610 00	.....	.....	.....	.....	.....	.....	.....	12,144.10	1,093 15	08.9
8	Deer Lodge ..	40,414 00	313 87	.....	.....	.....	160 00	320 00	480 00	.....	.....	42,327.87	5,227 90	12.3
9	Fergus ..	212,536 62	12,121 19	.....	.....	.....	.....	319 42	.....	.....	1,275 61	226,252.84	23,695 42	10.4
10	Flathead ..	5,247 35	1,882 77	200 00	1,013 08	342 00	80 00	80 14	.....	.....	.....	8,845.84	4,034 43	45.8
11	Gallatin ..	24,120 00	2,800 00	3,040 00	5,155 87	3,240 00	2,678 00	160 00	.....	1,937 00	.....	43,130.87	7,969 82	18.4
12	Granite ..	5,040 00	800 00	.....	.....	.....	.....	.....	.....	.....	.....	5,840.00	865 00	14.8
13	Jefferson ..	9,024 92	320 00	.....	.....	.....	160 00	.....	.....	1,080 00	.....	10,584.92	998 65	09.4
14	Lewis & Clarke	44,983 26	.....	6,780 10	4,403 53	2,292 00	240 00	10,116 84	1,160 00	2,280 00	.....	72,255.63	8,470 93	11.7
15	Madison ..	41,415 89	640 00	15,059 21	1,040 00	2,671 45	1,315 80	.....	3,439 80	1,353.36	.....	66,935.51	5,676 25	08.5
16	Meagher ..	6,117 84	3,200 00	640 00	80 00	1,120 00	.....	14,850 21	10,084 30	12,962 16	.....	110,054.51	13,323 59	12.1
17	Missoula ..	6,556 50	1,120 00	320 00	.....	795 03	898 48	.....	.....	.....	.....	9,690.01	1,769 70	18.2
18	Park ..	32,455 72	172 45	.....	.....	.....	.....	.....	.....	.....	.....	32,628.17	3,528 95	10.8
19	Powell* ..	5,623 99	.....	520 00	.....	.....	.....	.....	4,112 80	.....	.....	10,256.79	967 00	09.4
20	Ravalli ..	13,889 05	.....	2,616 32	.....	1,800 00	.....	5,464 00	.....	.....	.....	23,769.39	2,554 90	10.8
21	Rosebud* ..	6,424 16	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,424.16	404 75	06.3
22	Silver Bow ..	6,006 33	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,006.33	755 00	12.5
23	Sweet Grass ..	45,992 87	.....	.....	.....	.....	.....	1,280 00	.....	.....	.....	47,272.87	5,170 05	10.9
24	Teton	156,108 21	.....	1,300 00	2,800 00	8,715 42	.....	4,186 83	.....	.....	.....	173,110.46	18,075 14	10.4
25	Valley ..	26,067 42	.....	.....	.....	.....	.....	1,360 00	.....	.....	.....	27,427.42	2,641 30	09.6
26	Yellowstone ..	68,412 45	1,665 00	.....	.....	.....	.....	.....	.....	.....	.....	70,077.45	5,865.50	08.3
	Totals ..	1,355,545 43	28,543 71	47,376 64	61,991 59	52,657 98	5,532 28	67,811 30	30,488 54	25,172 52	1,275 61	1,676,395 60	\$186,553 52	11.1

* This includes only land leased since creation of the county.

BOUNTIES ON

BOUNTY CERTIFI

COUNTY	NUMBER OF ANIMALS														
	Coyotes				Coyote Pups...	Wolves				Wolf Pups		Mount'n Lions..	Bear....	Lynx or Bobcat..	
	Law of	1901	1899	1895		1891	1901	1899	1895	1891	1901				1899
Beaverhead	1,166	243	1	....	150	7	....	....	....	....	....	....	....	....
Broadwater	154	31	....	....	81	3	....	....	....	....	....	....	....	....
Carbon	194	69	....	....	85	13	4	....	....	14	....	....	....	....
Cascade	510	97	1	4	522	71	13	....	....	118	....	....	....	....
Choteau	3,136	383	....	....	4,074	192	27	....	7	1041	....	....	....	3
Custer	1,962	612	56	....	1,039	213	106	19	....	441	3	....	....	8
Dawson	906	185	....	....	491	147	17	....	9	161	....	....	....	....
Deer Lodge	177	122	....	....	47	....	2	....	....	....	....	1	....	....
Fergus	1,373	280	19	....	....	127	....	4	....	901	5	1	....	....
Flathead	534	78	1	....	79	1	....	....	....	....	....	18	1	....
Gallatin	418	147	1	....	189	11	1	....	....	18	....	2	4	3
Granite	246	71	....	....	24	....	....	....	....	....	....	1	....	....
Jefferson	209	100	....	....	48	1	2	....	....	....	....	....	....	....
Lewis and Clarke	652	85	1	....	249	56	18	....	....	37	4	....	....	....
Madison ..	842	158	....	....	26	....	....	....	....	....	....	....	....	....
Meagher	304	215	....	....	91	66	32	....	....	37	....	....	....	....
Missoula	425	104	....	....	39	3	....	....	....	....	....	6	14	3
Park..	319	99	4	....	173	3	5	....	....	1	....	3	13	8
Ravalli	152	57	....	....	86	....	....	....	....	....	....	5	....	....
Rosebud	1,493	17	....	....	287	219	....	....	....	565	....	....	....	....
Silver Bow	365	16	....	....	9	....	....	....	....	....	....	....	....	....
Sweet Grass	291	114	3	....	140	44	11	1	....	15	....	2	....	....
Teton..	901	98	....	....	2,128	37	4	....	....	187	....	....	....	....
Valley	1,864	564	....	....	2,523	78	29	....	....	200	....	....	....	....
Yellowstone	1,202	412	1	....	404	111	37	....	1	202	....	1	....	1
Totals	19,795	4,357	88	4	12,984	1,403	302	24	17	393	12	39	33	16	

TABLE SHOWING BOUNTY CERTIFICATES FILED JANUARY 1, 1902, TO
SEPTEMBER 30, 1902, BY COUNTIES, AS REPORTED BY MR. N. N.
DAVIDSON, CLERK STATE BOARD OF EXAMINERS.

Beaverhead	\$7,001 00	Madison ..	3,329 00
Broadwater	977 00	Meagher	2,379 00
Carbon	1,930 00	Missoula	2,156 00
Cascade	4,751 00	Park	2,463 00
Choteau	26,745 00	Powell	2,220 00
Custer	14,871 00	Ravalli	1,159 00
Dawson	8,460 00	Rosebud	12,070 00
Deer Lodge	800 00	Silver Bow	1,042 00
Fergus	9,679 00	Sweet Grass	2,417 00
Flathead	2,267 00	Teton	14,783 00
Gallatin	2,648 00	Valley	22,430 00
Granite	895 00	Yellowstone	6,451 00
Jefferson	1,265 00		
Lewis and Clarke	2,919 00	Total	\$158,107 00

WILD ANIMALS

CATES FILED 1901.

AMOUNT OF CERTIFICATE														
Coyotes				Coyote Pups...	Wolves				Wolf Pups		Mount'n Lions..	Bear....	Lynx or Bobcat	Total Amt Paid....
1901	1899	1895	1891	1901	1901	1899	1895	1891	1901	1899				
5,830	486	3	.....	750	35	.....	.....	.....	.....	.....	.....	.....	.....	7,104
770	62	.....	.....	405	15	.....	.....	.....	.....	.....	.....	.....	.....	1,252
970	138	.....	.....	425	65	20	.....	.....	70	.....	.....	.....	.....	1,688
2,550	194	3	8	2,610	355	65	.....	.....	590	.....	.....	.....	.....	6,375
15,680	766	.....	.....	20,370	960	135	.....	14	5,205	.....	.....	.....	3	43,133
9,810	1,224	168	.....	5,195	1,065	500	57	.....	2,205	6	.....	.....	8	20,238
4,530	370	.....	.....	2,455	735	85	.....	18	805	.....	.....	.....	.....	8,998
885	244	.....	.....	235	.....	10	.....	.....	.....	.....	.....	5	.....	1,379
6,865	560	57	.....	.....	635	.....	12	.....	4,505	10	7	.....	.....	12,651
2,670	156	3	.....	395	5	.....	.....	.....	.....	.....	126	5	.....	3,360
2,090	294	3	.....	945	55	5	.....	.....	90	.....	14	20	3	3,519
1,230	142	.....	.....	120	.....	.....	.....	.....	.....	.....	7	.....	.....	1,499
1,045	200	.....	.....	240	5	10	.....	.....	.....	.....	.....	.....	.....	1,500
3,260	170	3	.....	1,245	280	90	.....	.....	185	8	.....	.....	.....	5,241
4,210	316	.....	.....	130	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,656
1,520	430	.....	.....	455	330	160	.....	.....	185	.....	.....	.....	.....	3,080
2,125	208	.....	.....	195	15	.....	.....	.....	.....	.....	42	70	3	2,658
1,595	198	12	.....	865	15	25	.....	.....	5	.....	21	65	8	2,809
760	114	.....	.....	430	.....	.....	.....	.....	.....	.....	35	.....	.....	1,339
7,465	34	.....	.....	1,435	1,095	.....	.....	.....	2,825	.....	.....	.....	.....	12,854
1,825	32	.....	.....	45	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,902
1,455	228	9	.....	700	220	55	3	.....	75	.....	14	.....	.....	1,759
4,505	196	.....	.....	10,640	185	20	.....	.....	935	.....	.....	.....	.....	16,481
9,320	1,128	.....	.....	12,615	390	145	.....	.....	1,000	.....	.....	.....	.....	24,598
6,010	824	3	.....	2,020	555	185	.....	.....	2	1,010	.....	7	.....	10,617
98,975	8,714	264	8	64,920	7,015	1,510	72	34	19690	24	273	165	26	201,690

STATEMENT SHOWING BOUNTY CERTIFICATES FILED, JANUARY 1, 1902,
TO SEPTEMBER 30, 1902, BY LAWS UNDER WHICH THE BOUNTIES
WERE PAID, AS REPORTED BY MR. N. N. DAVIDSON, CLERK OF THE
STATE BOARD OF EXAMINERS.

16,339 Coyotes, present law	\$81,695 00	
6 Coyotes, law of 1895	18 00	
98 Coyotes, law of 1899	196 00	
		\$81,909 00
12,658 Coyote pups, present law	63,290 00	
99 Coyote pups, law of 1899.....	158 00	
		63,448 00
761 Wolves, present law	3,805 00	
6 Wolves, law of 1891	12 00	
		3,817 00
1,691 Wolf pups, present law		8,455 00
56 Mountain lions, present law	392 00	
1 Mountain lion, law of 1891	5 00	
		397 00
1 Bob cat, law of 1891		1 00
16 Bear, law of 1891		80 00
Total		\$158,107 00

Official Directory.

CONGRESSIONAL DELEGATION.

OFFICE.	NAME AND RESIDENCE.	TERM EXPIRES
United States Senator.....	William A. Clark, Butte.....	March 4, 1907.
United States Senator.....	Paris Gibson, Great Falls.....	March 4, 1905.
Representative in Congress...	Joseph M. Dixon, Missoula.....	March 4, 1905.

Officers and Members of the Eighth Legislative Assembly

Regular session convenes at 12 o'clock on the first day of January, each odd numbered year. Limit of session, sixty days.

Governor... Joseph K. Toole.
Lieutenant Governor and President of Senate....Frank G. Higgins.

MEMBERS OF THE SENATE OF THE EIGHTH LEGISLATIVE ASSEMBLY.
(Term of Office Four Years.)

COUNTY.	NAME AND POLITICS.	ADDRESS.	ELECTED.
Beaverhead.....	James P. Murray, Dem....	Dillon.....	Nov. 6, 1900.
Broadwater.....	Charles A. Whipple, Dem..	Townsend.....	Nov. 4, 1902.
Carbon.....	William F. Meyer, Rep....	Red Lodge.....	Nov. 6, 1900.
Cascade.....	Fletcher Maddox, Rep....	Great Falls.....	Nov. 4, 1902.
Choteau	George B. Bourne, Rep....	Hill.....	Nov. 4, 1902.
Custer.....	Kenneth McLean, Rep....	Miles City.....	Nov. 6, 1900.
Dawson.....	Thomas P. Cullen, Dem....	Glendive.....	Nov. 6, 1900.
Deer Lodge.....	Jacob M. Kennedy, Fusion	Anaconda.....	Nov. 6, 1900.
Fergus.....	John D. Waite, Rep.....	Lewistown.....	Nov. 4, 1902.
Flathead.....	William J. Brennan, Rep..	Big Fork.....	Nov. 4, 1902.
Gallatin... ..	Charles W. Hoffman, Dem..	Bozeman.....	Nov. 6, 1900.
Granite.....	George P. Durham, Dem..	Phillipsburg.....	Nov. 4, 1902.
Jefferson.....	Henry L. Sherlock, Dem..	Boulder.....	Nov. 4, 1902.
Lewis and Clarke.....	Wesley M. Biggs, Dem....	Helena.....	Nov. 6, 1900.
Madison.....	Jacob M. Albright, Rep...	Virginia City.....	Nov. 4, 1902.
Meagher.....	Elmer J. Anderson, Rep...	White Sulphur Springs	Nov. 6, 1900.
Missoula	Edward Donlan, Rep.....	Missoula.....	Nov. 4, 1902.
Park.....	John M. Conrow, Dem....	Livingston.....	Nov. 6, 1900.
Powell.....	Conrad C. Kohrs, Rep....	Deer Lodge.....	Nov. 4, 1902.
Ravalli.....	Edward A. Johnson, Dem..	Hamilton.....	Nov. 4, 1902.
Rosebud.....	James S. Hopkins, Dem...	Forsyth.....	Nov. 4, 1902.
Silver Bow	Daniel Tewey, Fusion....	Butte.....	Nov. 4, 1902.
Sweet Grass	James N. Kelley, Rep.....	Hunter's Hot Springs.	Nov. 6, 1900.
Teton	Samuel F. Ralston, Dem..	Choteau.....	Nov. 4, 1902.
Valley	Archibald W. Mahon, Dem	Glasgow.....	Nov. 4, 1902.
Yellowstone.....	Christian Yegen, Rep.....	Billings.....	Nov. 4, 1902.

MEMBERS OF THE HOUSE OF REPRESENTATIVES OF THE EIGHTH LEGISLATIVE ASSEMBLY.

Elected November 4, 1902. Term of office two years.

COUNTY.	NAME AND POLITICS.	ADDRESS.
Beaverhead.....	George Woodworth, Rep.....	Wisdom.
	Benjamin F. White, Rep.....	Dillon.
Broadwater.....	David F. Williams, Rep.....	Radersburg.
	Herbert E. Johnson, Rep.....	Winston.
Carbon.....	John N. Tolman, Rep.....	Red Lodge.
Cascade.....	William H. Harrison, Rep.....	Neihart.
	Patrick B. Buchanan, Rep.....	Belt.
	Charles A. Wilson, Rep.....	Great Falls.
	Louis J. Pearson, Rep.....	Great Falls.
	George R. Wood, Dem.....	Great Falls.
Choteau	James H. Rice, Rep.....	Ft. Benton.
	Thomas M. Everett, Rep.....	Harlem.
Custer.....	Henry N. Sykes, Rep.....	Ekalaka.
	George W. Burt, Rep.....	Terry.
Dawson.....	George W. McCone, Rep.....	Reeta.
Deer Lodge.....	Leon E. Beaudry, Labor.....	Anaconda.
	Timothy C. O'Keefe, Labor.....	Anaconda.
	John Morrissey, Labor.....	Anaconda.
	Frederick Gagner, Labor.....	Anaconda.
	Joseph H. Schwend, Labor.....	Anaconda.
	William R. Allen, Rep.....	Anaconda.
Fergus.....	Ernest W. King, Rep.....	Lewistown.
	David Hilger, Dem.....	Lewistown.
Flathead.....	John R. Hilman, Rep.....	Columbia Falls.
	John M. Noble, Rep.....	Kalispell.
	Harvey S. Cannon, Rep.....	Kalispell.
Gallatin... ..	Nelson Story, Jr., Rep.....	Bozeman.
	Walter H. Sales, Rep.....	Manhattan.
	James E. Martin, Dem.....	Bozeman.
Granite.....	Henry W. Lehsou, Rep.....	Garnet.
	Samuel Arthur, Dem.....	Granite.
Jefferson.....	Duncan A. MacDonald, Rep.....	Alhambra.
	John Flaherty, Dem.....	Cold Spring.
	Timothy D. Downey, Dem.....	Basin.
Lewis and Clarke.....	Oscar M. Lanstrum, Rep.....	Marysville.
	Fred G. Benson, Rep.....	Helena.
	Charles B. Miller, Rep.....	Helena.
	Charles H. Bray, Rep.....	Helena.
	Louis Stadler, Rep.....	Helena.
	John B. Wilson, Rep.....	Helena.
	Charles F. Word, Dem.....	Helena.
Madison.....	Frank B. Linderman, Rep.....	Sheridan.
	John H. Miles, Rep.....	Pony.
	Thomas H. Teal, Rep.....	Virginia City.
Meagher.....	Harry J. Giltinan, Rep.....	White Sulphur Springs.
	Clarence P. Tooley, Rep.....	Two Dot.
Missoula	Reuben Dwight, Rep.....	Missoula.
	Davis Graham, Rep.....	Missoula.
	Charles M. Owen, Rep.....	Missoula.
	James M. Self, Rep.....	Plains.
Park.....	Charles S. Hefferlin, Rep.....	Livingston.
	Thomas M. Swindlehurst, Dem.....	Livingston.
Powell.....	Henry J. Faust, Rep.....	Ovando.
Ravalli.....	Aaron Connor, Rep.....	Darby.
	John W. Lancaster, Rep.....	Stevensville.
Rosebud.....	William Bray, Rep.....	Rosebud.
Silver Bow	John MacGinniss, Fusion.....	Butte.
	Patrick Mullins, Fusion.....	Butte.

COUNTY.	NAME AND POLITICS.	ADDRESS.
Silver Bow.....	James H. Lynch, Fusion.....	Butte.
	Guy W. Stapleton, Fusion.....	Butte.
	Joseph Shannon, Fusion.....	Butte.
	Louis Lienemann, Fusion.....	Butte.
	Lawrence Duggan, Fusion.....	Butte.
	Robert W. Farmer, Fusion.....	Butte.
	Frank J. Pelletier, Fusion.....	Butte.
	Charles W. Dempster, Fusion.....	Butte.
	Frank B. Axtell, Fusion.....	Butte.
Sweet Grass	William F. Whiteley, Fusion.....	Butte.
	Robert Brownlee, Rep.....	Melville.
Teton	Jonathan E. Webb, Rep.....	Choteau.
Valley	Harry A. Vagg, Rep.....	Saco.
Yellowstone.....	Chauncey C. Bever, Rep.....	Billings.

REPRESENTATIVE DISTRICTS AND APPORTIONMENT

Each County is Entitled to one Senator.

Beaverhead	2	Missoula.....	4
Broadwater	2	Park.....	2
Carbon	1	Powell	1
Cascade	5	Ravalli	1
Choteau	2	Rosebud	1
Custer.....	2	Silver Bow.....	12
Dawson	1	Sweet Grass.....	1
Deer Lodge.....	6	Teton.....	1
Fergus.....	2	Valley	1
Flathead.....	3	Yellowstone....	1
Gallatin	3		
Granite	2	Total.....	72
Jefferson.....	3	One senator from each county.....	26
Lewis and Clarke.....	7		
Madison.....	3	Total membership of Eighth Leg-	
Meagher.....	2	islative Assembly.....	98

ROSTER OF THE SENATE.

OFFICE.	NAME OF OFFICERS.	COUNTY.
President.....	Frank G. Higgins.....	Missoula.
President Pro Tempore.....	Wesley M. Biggs.....	Lewis and Clarke.
Secretary.....	X. K. Stout.....	Flathead.
Assistant Secretary.....	C. E. Woodworth.....	Missoula.
Sergeant-at-Arms.....	J. J. Grant.....	Silver Bow.
Assistant Sergeant-at-Arms.....	Thomas P. Sherlock	Jefferson.
Journal Clerk.....	D. J. Whaley.....	Missoula.
Assistant Journal Clerk.....	C. B. Taber.....	Rosebud.
Engrossing Clerk.....	G. W. Richardson.....	Choteau.
Enrolling Clerk.....	Mrs. Grace Dyson.....	Missoula.
Clerk to President.....	Hugh Kennedy.....	Missoula.
Chaplain.....	Rev. Walter M. Jordan.....	Lewis and Clarke.
Door keepers	James Perkins.....	
	J. B. Cain.....	
	Alf. Hillman	
Day Watchman.....	Con Bray.....	
Night Watchman	Charles McFarlane	
Pages	Albert Mickel	
	Eddie Walte.....	
	James Donovan.....	

ROSTER OF THE HOUSE.

OFFICE.	NAME.	COUNTY.
Speaker.....	B. F. White.....	Beaverhead.
Speaker Pro Tempore.....	Aaron Connor.....	Ravalli.
Chief Clerk.....	Nathan Godfrey.....	Meagher.
Assistant Chief Clerk.....	James A. Shoemaker.....	Lewis and Clarke.
Journal Clerk.....	J. R. Eardley.....	Deer Lodge.
Sergeant-at-Arms.....	Marshall Race.....	Cascade.
Assistant Sergeant-at-Arms.....	J. H. McFarland.....	Lewis and Clarke.
Enrolling Clerk.....	Miss Alice MacDonald.....	Jefferson.
Engrossing Clerk.....	Mrs. J. S. Keerl.....	Lewis and Clarke.
Doorkeepers	Michael Leahy.....	Missoula.
	David Keenan.....	Lewis and Clarke.
Day Watchman.....	N. C. Kinney.....	Madison.
Night Watchman.....	B. F. Hooper.....	Lewis and Clarke.
Janitor.....	Oliver Arnett.....	Lewis and Clarke.
Chaplain.....	Rev. A. D. Raleigh.....	Lewis and Clarke.
Pages.....	Irvine Wiess.....	
	Guy Allen.....	
	Joseph Pearson.....	
	Fred Thiem.....	
	Tom Donnelly.....	

LIST OF STATE OFFICIALS OF STATE OF MONTANA.

OFFICE.	NAME OF OFFICER.	RESIDENCE.
Governor.....	J. K. Toole.....	Helena.
Lieutenant Governor	Frank G. Higgins.....	Missoula.
Secretary of State.....	George M. Hays.....	Billings.
State Treasurer	A. H. Barret.....	Butte.
Attorney General.....	James Donovan.....	Great Falls.
State Auditor.....	J. H. Calderhead.....	Helena.
Superintendent Public Instruction.....	W. W. Welch.....	Billings.

SUPREME COURT STATE OF MONTANA.

OFFICE	NAME	P. O. ADDRESS	ELECTED	TERM EXPIRES
Chief Justice.....	Theodore H. Brantley...	Helena.....	Nov. 8, 1898	Jan. 2, 1905.
Associate Justice.....	George R. Milburn.....	Helena.....	Nov. 6, 1900	Jan. 7, 1907.
Associate Justice.....	William L. Holloway...	Helena.....	Nov. 4, 1902	Jan. 4, 1909.

Clerk of Supreme Court—H. G. Rickerts.

Marshal of Supreme Court—T. E. Crutcher.

Stenographer Supreme Court—A. C. Schneider.

Attendant Supreme Court—William H. Curtis.

OFFICERS APPOINTED BY THE GOVERNOR.

OFFICE	NAME	Address	Politics	Appointed	Term Expires
Private Secretary to Governor.....	*Lon Hoss.....	Helena	Democrat..	April 2, 1901..	Jan. 2, 1905..
State Land Agent.....	Henry Neill	Helena	Populist ..	Aug. 12, 1901..	Aug. 12, 1905..
Register State Land Office	T. D. Long	Helena	Democrat..	Mar. 20, 1901..	Mar. 20, 1905..
Commissioner Agr., Labor and Ind.	J. A. Ferguson.....	Helena	Labor	Jan. 21, 1901..	Jan. 21, 1905..
State Examiner.....	Wm. Hudnall	Helena	Democrat..	Mar. 4, 1901..	Mar. 4, 1905..
State Veterinary Surgeon	Morton E. Knowies..	Helena	Democrat..	Mar. 7, 1901..	Mar. 7, 1905..
Inspector of Mines	John Byrne	Helena	Populist...	Feb. 13, 1901..	Feb. 13, 1905..
Deputy Inspector of Mines.....	John J. Barry	Butte	Democrat..	Feb. 19, 1901..	Feb. 19, 1905..
State Boiler Inspector	James H. Dailey	Helena	Democrat ..	Mar. 2, 1901..	Mar. 2, 1905..
Assistant Boiler Inspector.....	J. D. O'Brien.....	Helena	Democrat..	Mar. 2, 1901..	Mar. 2, 1905..
Game and Fish Warden.....	Wm. F. Scott.....	Helena	Democrat..	Mar. 25, 1901	Mar. 25, 1905..
Librarian Historical Society	Mrs. Laura E. Howey	Helena			
Custodian Ft. Ellis Reservation	Andrew C. Harding.	Bozeman ..		Jan. 30, 1897..	
Custodian Ft. Maginnis Reservation	Otto Anderson.....	Ft. Maginnis		Feb. 6, 1897..	

*Appointed to fill vacancy caused by death of Randolph Thompson.

STATE BOARD OF EXAMINERS.

MEMBERS.	TITLE.	ORGANIZATION.
Joseph K. Toole.....	Governor.....	President.
George M. Hays.....	Secretary of State.....	Secretary.
James Donovan.....	Attorney General.....	Member.

Clerk of the Board, N. N. Davidson.

STATE FURNISHING BOARD.

MEMBERS.	TITLE.	ORGANIZATION.
Joseph K. Toole.....	Governor.....	President.
George M. Hays.....	Secretary of State.....	Secretary.
James Donovan.....	Attorney General.....	Member.

STATE BOARD OF EQUALIZATION.

MEMBERS.	TITLE.	ORGANIZATION
Joseph K. Toole.....	Governor.....	President.
George M. Hays.....	Secretary of State.....	Secretary.
James Donovan.....	Attorney General.....	Member.
A. H. Barret.....	Treasurer.....	Member.
J. H. Calderhead.....	Auditor.....	Member.

Clerk of the Board, J. J. Ryan.

STATE BOARD OF LAND COMMISSIONERS.

MEMBERS.	TITLE.	ORGANIZATION
Joseph K. Toole.....	Governor.....	President.
W. W. Welch.....	Supt. of Public Instruction.....	Secretary.
George M. Hays.....	Secretary of State.....	Member.
James Donovan.....	Attorney General.....	Member.

Clerk of the Board, Joseph Oker.

ARID LAND GRANT COMMISSION.

MEMBERS	ORGANIZATION	P. O. ADDRESS	APPOINTED	TERM EXPIRES
T. C. Marshall..	Chairman.....	Missoula.....	March 17, 1899....	April 3, 1901.
D. A. Cory.....	Secretary.....	Helena.....	March 17, 1899....	April 3, 1905.
Donald Bradford	Member.....	Helena.....	April 3, 1897.....	April 3, 1901.
J. T. Brown....	Member.....	Miles City.....	Jan. 8, 1900.....	April 3, 1905.

STATE BOARD OF PRISON COMMISSIONERS.

MEMBERS.	TITLE.	ORGANIZATION
Joseph K. Toole.....	Governor	President.
George M. Hays.....	Secretary of State.....	Secretary.
James Donovan.....	Attorney General	Member.

Clerk of the Board, S. C. Ashby.

STATE BOARD OF PARDONS.

MEMBERS.	TITLE.	ORGANIZATION.
Joseph K. Toole.....	Governor	President.
George M. Hays.....	Secretary of State.....	Secretary.
James Donovan.....	Attorney General	Member.

Clerk of the Board, Otto Schoenfeldt.

STATE BOARD OF COMMISSIONERS FOR INSANE.

MEMBERS.	TITLE.	ORGANIZATION.
Joseph K. Toole.....	Governor	President.
George M. Hays.....	Secretary of State.....	Secretary.
James Donovan.....	Attorney General	Member.

STATE BOARD OF CHARITIES AND REFORM.

MEMBERS	ORGANIZATION	P. O. ADDRESS	APPOINTED	TERM EXPIRES
E. J. Groeneveld...	President.....	Butte.....	March 13, 1897....	March 13, 1903.
W. W. Van Orsdel.	Secretary.....	Great Falls.....	March 2, 1899....	March 13, 1905.
Walter N. Jordon.	Member.....	Helena.	Oct. 8, 1901.....	Oct. 8, 1907.

HOME FOR ORPHANS, FOUNDLINGS AND DESTITUTE CHILDREN,
TWIN BRIDGES.

BOARD OF TRUSTEES AND MANAGEMENT.

MEMBERS	ORGANIZATION	P. O. ADDRESS	APPOINTED	TERM EXPIRES
P. Carney.....	President.....	Waterloo.....	March 20, 1901....	March 20, 1905.
W. M. Oliver.....	Secretary.....	Dillon.....	March 20, 1901....	March 20, 1905.
Martin Elser.....	Treasurer.....	Sheridan.....	March 20, 1901....	March 20, 1905.
John R. Comfort...	Member.....	Twin Bridges....	April 10, 1899....	March 27, 1903.
Amos Eastman....	Member.....	Twin Bridges....	May 21, 1899.....	May 21, 1903.

Wiley Mountjoy, Superintendent, Twin Bridges.

STATE CAPITOL COMMISSION.

MEMBERS	ORGANIZATION	P. O. ADDRESS	APPOINTED	TERM EXPIRES
Joseph K. Toole...	Chairman ex-officio	Helena.....		
J. M. Fox.....	Member.....	Missoula.....	Jan. 1, 1897.....	Not Specified.
A. D. Peck.....	Member.....	Deer Lodge	Jan. 1, 1897.....	Not Specified.
Elizur Beach.....	Member.....	Helena	Jan. 18, 1897....	Not Specified.
Thomas Greenough	Member.....	Missoula.....	Feb. 3, 1901.....	Not Specified.

E. B. Kennedy, Secretary.

STATE LAW LIBRARY BOARD OF TRUSTEES.

MEMBERS	ORGANIZATION	ADDRESS	APPOINTED	TERM	TERM EXPIRES
Theo. Brantley....	President.	Helena....	Ex-officio.....	Six years.....	Jan. 2, 1905.
George R. Milburn	Member...	Helena....	Ex-officio.....	Six years.....	Jan. 7, 1907.
Wm. L. Holloway.	Member...	Helena....	Ex-officio.....	Six years.....	Jan. 4, 1909.
J. H. Calderhead..	Member...	Helena....	Ex-officio.....	Four years.....	Jan. 7, 1905.
George M. Hays..	Secretary.	Helena....	Ex-officio.....	Four years.....	Jan. 7, 1905.

Librarian, O. T. Crane.

STATE HISTORICAL SOCIETY BOARD OF TRUSTEES.

MEMBERS	ORGANIZATION	ADDRESS	APPOINTED	TERM	TERM EXPIRES
Wm. B. Huntley.....	President.	Helena.....	March 2, 1901..	Four years.	March 2, 1905.
Massena Bullard.....	Member..	Helena.....	March 2, 1901..	Four years.	March 2, 1905.
Granville Stuart.....	Member...	Butte.....	March 2, 1901..	Four years.	March 2, 1905.
Thomas A. Cummings	Member...	Ft. Benton.	March 2, 1901..	Four years.	March 2, 1905.
S. C. Gilpatrick.....	Member...	Helena.....	March 28, 1901.	Four years.	March 28, 1905.

Secretary and Librarian, Laura E. Howey.

STATE BOARD OF EDUCATION.

MEMBERS	ORGANIZATION	P. O. ADDRESS	APPOINTED	TERM EXPIRES
Joseph K. Toole....	President.....	Helena.....	Ex-officio.....	
W. W. Welch.....	Secretary.....	Helena.....	Ex-officio.....	
James Donovan....	Member.....	Helena.....	Ex-officio.....	
J. M. Evans.....	Member.....	Missoula.....	Feb. 7, 1902.....	Feb. 1, 1906.
N. W. McConnell...	Member.....	Helena.....	Feb. 1, 1899.....	Feb. 1, 1903.
O. P. Chrisholm....	Member.....	Bozeman.....	March 17, 1900....	Feb. 1, 1904.
N. B. Holter.....	Member.....	Helena.....	Feb. 5, 1901.....	Feb. 1, 1905.
Charles R. Leonard	Member.....	Butte.....	Feb. 1, 1902.....	Feb. 1, 1906.
W. H. Johnson.....	Member.....	Billings.....	Dec. 12, 1901.....	Feb. 1, 1903.
J. G. McKay.....	Member.....	Hamilton.....	March 17, 1900....	Feb. 1, 1904.
G. T. Paul.....	Member.....	Dillon.....	Feb. 5, 1901.....	Feb. 1, 1905.

J. M. Lewis, Clerk.

STATE BOARD OF SCHOOL TEXT BOOK COMMISSIONERS.

MEMBERS	ORGANIZATION	ADDRESS	APPOINTED	TERM EXPIRES
Supt. Public Instruction, W. W. Welch	Chairman.	Helena....	Ex-officio.....	
E. O. Busenburg.....	Secretary.	Glendive..	March 25, 1897.	Not Specified.
Attorney General, James Donovan.....	Member...	Member..	Ex-officio.....	
Pres. Mont. University, O. J. Craig....	Member...	Missoula..	Ex-officio.....	
Pres. Agr. College, James Reid.....	Member..	Bozeman..	Ex-officio.....	
J. G. McKay.....	Member...	Butte.....	March 25, 1897.	Not Specified.
M. S. Stapleton	Member...	Anaconda.	March 25, 1897	Not Specified.

UNIVERSITY OF MONTANA, MISSOULA, EXECUTIVE COMMITTEE.

MEMBERS.	ORGANIZATION.	P. O. ADDRESS
J. H. T. Ryman.....	President.....	Missoula.
T. C. Marshall.....	Secretary	Missoula.
Herwin Knowles	Member	Missoula.

UNIVERSITY OF MONTANA, FACULTY.

Oscar J. Craig, A. M. Ph. D.....	President.
James M. Hamilton, M. S. V. Pres....	Professor of Psychology and History.
Cynthia E. Reiley, B. S.....	Professor of Mathematics.
W. M. Aber, A. B.....	Professor of Latin and Greek.
Frederick C. Scheuch, B. M. C. A. C...	Professor of Modern Languages.
Morton J. Elrod, A. M.....	Professor of Biology.
Arthur L. Westcott, B. M. E.....	Professor of Mechanical Engineering.
Frances Corbin, B. L.....	Professor of English Literature.
William D. Harkins, A. B.....	Professor of Chemistry.
Jesse P. Rowe, M. S.....	Professor of Physics and Geology.
Eloise Knowles, Ph. B.....	Instructor in Drawing and Assistant in English.
Mrs. Blanche Whittaker	Director of Music School.
Louise Hathaway, B. A.....	Instructor in English and Rhetoric.
Ruth Elsie Kellogg.....	Instructor in Elocution and Physical Culture.
Guy Sheridan	Laboratory Assistant in Chemistry.
James F. Anderson.....	Laboratory Assistant in Mechanical Engineering.
Benjamin D. Stewart.....	Laboratory Assistant in Biology.

STATE NORMAL SCHOOL, DILLON, MONTANA.

Control and General Supervision vested in State Board of Education.

LOCAL EXECUTIVE BOARD.

MEMBERS	ORGANIZATION	ADDRESS	APPOINTED	TERM EXPIRES
Leonard Eliel.....	President.....	Dillon.....	March 20, 1901..	March 20, 1905.
A. L. Stone.....	Secretary and Treasurer.	Dillon....	March 20, 1901..	March 20, 1905.
F. C. Kress.....	Member.....	Dillon.....	March 20, 1901...	March 20, 1905.
Edwin Norris.....	Member.....	Dillon.....	March 20, 1901..	March 20, 1905.
B. F. White.....	Member.....	Dillon.....	March 20, 1901...	March 20, 1905.

STATE NORMAL SCHOOL FACULTY.

Henry H. Swain, Ph. D., Pres.....	History and Economics.
Joseph E. Monroe, B. A.....	Natural Sciences.
Wm. Chandler Bagley, Ph. D.....	Psychology and Pedagogy, Director of Training Department.
Charles J. Fenner, M. S.....	Mathematics.
Lucy Hamilton Carson, A. M.....	English.
Bertha Frances Huntsman.....	Drawing, Assistant in Training.
Bertha Thormyer.....	Latin and German.
E. J. Pasmore.....	Vocal and Instrumental Music.
Mrs. Anna W. Owsley.....	Matron.

MONTANA COLLEGE OF AGRICULTURE AND MECHANIC ARTS AND THE EXPERIMENT STATION, BOZEMAN.

EXECUTIVE BOARD.

MEMBERS	ORGANIZATION	P. O. ADDRESS	APPOINTED	TERM EXPIRES
Walter S. Hartman.	President.....	Bozeman.....	Feb. 1, 1899.....	Feb. 1, 1903.
John M. Robinson.	Vice-President..	Bozeman.....	Feb. 1, 1899.....	Feb. 1, 1903.
Joseph Kountz	Member.....	Bozeman.....	Feb. 1, 1900.....	Feb. 1, 1904.
E. B. Lamme.....	Member.....	Bozeman.....	Feb. 1, 1901.....	Feb. 1, 1905.
Peter Koch	Secretary.....	Bozeman.....	Feb. 1, 1902.....	Feb. 1, 1906.

EIGHTH BIENNIAL REPORT OF BUREAU

FACULTY OF AGRICULTURAL COLLEGE.

James Reid, A. B.....	President.
Frank W. Traphagen	Professor of Physics, Chemistry and Geology.
Mrs. F. E. Marshall	Professor of Art.
W. H. Williams, B. E. E.....	Professor of Electrical Engineering.
W. F. Brewer, A. M.....	Professor of Latin and English.
Aaron H. Currier, A. M.....	Professor of French and German.
Miss Lilla A. Harkins, M. S.....	Professor of Domestic Science.
J. W. Blankinship, Ph. D.....	Professor of Botany.
Samuel Fortier, Ma. E.....	Professor of Civil Engineering.
R. A. Cooley, B. S.....	Professor of Zoology and Entomology.
W. M. Cobleigh, A. M.....	Assistant Professor of Physics.
W. D. Tallman, B. S.....	Professor of Mathematics.
J. H. Gill, M. E.....	Assistant Professor of Mechanical Practice.
J. A. Thaler, E. E.....	Assistant Professor of Mechanical Engineering.
H. G. Phelps	Principal of Business Department.
Miss M. A. Cantwell	Principal of Preparatory Department.
Miss Helen R. Brewer, A. B.....	Instructor in Latin and History.
Miss Emma Stockinger.....	Instructor in Stenography and Type-writing.
Mrs. Mabel Kinney Hall, Ph. B.....	Instructor in Preparatory Department.
J. S. Baker, B. S.....	Instructor in Civil Engineering.
George B. Couper, B. M. E.....	Assistant in Shops.
N. V. Johnson, M. Accts.....	Assistant in the Business Department.
Miss Kate Calvin.....	Head of Piano Department.
Miss Grace Stanton.....	Instructor in Piano Department.
Miss Winifred G. Kinney.....	Instructor in Vocal Music.
Mrs. Mary Winter.....	Librarian.
John F. Davies, A. M.....	Special Expert Librarian.

MONTANA STATE SCHOOL OF MINES.

COMMISSION AND BOARD OF TRUSTEES.

MEMBERS	ORGANIZATION	ADDRESS	APPOINTED	TERM EXPIRES
John E. Rickards...	Chairman..	Butte.....	Jan. 1, 1900.....	Jan. 1, 1904.
George E. Moulthrop	Secretary...	Butte.....	Jan. 1, 1900.....	Jan. 1, 1904.
W. A. Clark, Jr.....	Treasurer..	Butte.....	Jan. 1, 1900.....	Jan. 1, 1904.
W. Y. Pemberton ...	Member....	Butte.....	Jan. 1, 1902.....	Jan. 1, 1906.
George H. Robinson	Member....	Butte.....	Jan. 1, 1902.....	Jan. 1, 1906.

FACULTY.

Nathan R. Leonard, A. M.....	President and Professor of Mathematics.
William G. King, A. M.....	Professor of Chemistry and Metallurgy
Alexander N. Winchell, Doctor Univ. Paris	Professor of Geology and Mineralogy.
Charles H. Bowman, M. S.....	Professor of Mechanics.
E. H. MacDonald, M. E.....	
C. W. Clark	Professor of Mining Engineering.
John B. Clayberg	Lecturer on Mining Law.
Charles A. Diehl, B. S.....	Assistant Professor of Chemistry.
Leon R. Foote, B. L.....	Instructor in the Preparatory Classes.
John S. Schmidt.....	Assistant in Chemical Laboratory.
Joseph Robert.....	Janitor.

STATE REFORM SCHOOL, MILES CITY, MONT.
BOARD OF TRUSTEES AND MANAGEMENT.

MEMBERS	TITLE	ADDRESS	APPOINTED	TERM EXPIRES
J. W. Strevell.....	President.....	Miles City.....	March 29, 1899...	March 29, 1903.
John S. Truscott...	Member.....	Miles City.....	March 27, 1901..	March 27, 1905.
J. B. Hawkins.....	Member.....	Miles City.....	April 1, 1900.....	April 1, 1904.

MANAGEMENT AND INSTRUCTORS.

C. B. Dickinson.....	Director.
Mrs. C. B. Dickinson.....	Matron.
J. E. Campbell.....	Supt. Boys Building and Band Instr.
E. W. Cook.....	Officer Co. "B." and Farmer.
Frank Cass	Officer Co. "A." and Teamster.
Joseph Jenison	Teacher.
Mrs. Joseph Jenison	Teacher.
John Fliechek	Shoemaker.
George N. Cheever	Engineer.
Mrs. George N. Cheever.....	Seamstress.
Miss Lucretia Cheever.....	Vocal Music Teacher.
Charles E. Hamilton.....	Cook Boys' Building.
Mrs. D. L. Shy.....	Cook Girls' Building.
Lena Olsen	Laundress.
John A. Dickson.....	Night Watchman.

STATE DEAF AND DUMB ASYLUM.

Control and Supervision Vested in State Board of Education.
BOARD OF TRUSTEES AND MANAGEMENT.

NAME	ORGANIZATION	P. O. ADDRESS	APPOINTED	TERM EXPIRES
John F. Sheehy....	President.....	Boulder.....	June 1, 1900.....	March 1, 1903
Dan McNeil.....	Member.....	Boulder.....	April 1, 1902.....	May 1, 1904.
Charles Scharf.....	Secretary.....	Boulder.....	March 21, 1902..	March 21, 1905

Thos. S. McAloneySuperintendent.

TEACHERS.

Philip H. Brown.....	Teacher of the Deaf.
Allen T. Schoolfield.....	Teacher of the Deaf.
Miss Carrie R. Stinson.....	Teacher of the Deaf.
Miss Ellerbe Holt.....	Teacher of the Blind.
Max W. Voss.....	Teacher of Music.

MANAGEMENT.

Austin L. Ward, M. D.....	Physician.
Mrs. Alice L. Harris.....	Matron.
Miss Louise H. Fisher.....	Girls Supervisor.
Buford L. Allen	Boys Supervisor.
Ira D. Shope	Engineer and Night Man.
John P. Finerty	Assistant Engineer and Farmer.

INDUSTRIAL DEPARTMENT.

Philip H. Brown	Teacher of Carpentry.
Buford L. Allen	Teacher of Printing.
Max W. Voss	Teacher of Plano Tuning and Ham- mock Weaving.
Miss Carrie R. Stinson.....	Teacher of Dressmaking.
Mrs. Allis L. Harris	Teachers of Sewing and Needlework.
Miss Louisa Fischer.....	

STATE ORPHANS' HOME.
BOARD OF TRUSTEES.

NAME	ORGANIZATION	P. O. ADDRESS	APPOINTED	TERM EXPIRES
Patrick Carney....	President.....	Waterloo.....	March 20, 1901...	March 20, 1905.
John R. Comfort..	Secretary.....	Twin Bridges...	April 10, 1899....	March 27, 1903.
Amos Eastman.....	Treasurer.....	Twin Bridges...	May 21, 1900.....	March 27, 1903.
Marcus Elser	Member.....	Sheridan.....	May 27, 1901.....	May 27, 1905.
W. M. Oliver.....	Member.....	Dillon.....	March 20, 1901...	March 20, 1905.

MANAGEMENT AND EMPLOYEES.

Wiley Mountjoy	Superintendent.
Mrs. Wiley Mountjoy	Matron.
Mrs. Jessie Cowan.....	Assistant Matron.
Mrs. Tovey.....	Laundress.
Mrs. H. L. Willet.....	Cook.
Mrs. Desmeris.....	Baker.
Miss Blanche Bailey	Teacher.
Miss Bessie Vaughn	Teacher.
Miss Mary Chapman.....	Teacher.
Miss Laura Marshall	Manager Dining Room.
Miss Mabel Putnam.....	Nursery Matron.
Miss Carrie Matthews.....	Night Nurse.
Miss Ada Edson.....	Seamstress.
Miss Rose Carney	Seamstress.
R. R. Tovey.....	Steward and Fireman.

BOARD OF HORTICULTURE.

MEMBERS.	ORGANIZATION.	P. O. ADDRESS.
Olney Taylor.....	President....	Park City.
C. H. Edwards.....	Secretary.....	Butte.
E. N. Brandegee	Member.....	Helena.
C. H. Campbell	Member.....	Great Falls.
C. M. Allen.....	Member.....	Lo Lo.
J. H. Edwards.....	Member.....	Kalispell.
Gov. Joseph K. Toole.....	Ex-officio	Helena.

FRUIT INSPECTORS.

NAME.	DISTRICT.	P. O. ADDRESS.	COUNTY.
Olney Taylor.....	First	Park City.....	Yellowstone.
I. D. O'Donnell.....	First	Billings.....	Yellowstone.
C. H. Edwards.....	Second	Butte.....	Silver Bow.
E. N. Brandegee.....	Second	Helena.....	Lewis and Clarke
A. S. Johnson	Second	Dillon.....	Beaverhead.
C. E. Hubbard.....	Third	Great Falls.....	Cascade.
W. M. Wooldridge.....	Third	Hinsdale.....	Valley.
W. D. Luther.....	Third	Glasgow.....	Valley.
D. R. Thornber.....	Third	Chinook.....	Choteau.
W. B. Harlan.....	Fourth	Como.....	Ravalli.
E. M. Tucker.....	Fourth	Missoula.....	Missoula.
O. C. Estey.....	Fifth...	Big Fork.....	Flathead.
O. A. Parsons.....	Fifth.....	Kalispell.....	Flathead.

STATE BOARD OF PHARMACY.

MEMBERS	ORGANIZATION	P. O. ADDRESS	APPOINTED	TERM EXPIRES
E. A. Heuser.....	President.....	Butte.....	March 14, 1902.	March 14, 1905.
C. B. Hoskins.....	Secretary.....	Butte.....	Dec. 28, 1900..	Dec. 28, 1903.
F. A. Woehner.....	Treasurer.....	Great Falls.....	March 20, 1901	March 20, 1904.

BOARD OF MEDICAL EXAMINERS OF MONTANA.

MEMBERS	ORGANIZATION	P. O. ADDRESS	APPOINTED	TERM EXPIRES
F. W. McCrimmon	President.....	Butte.....	March 14, 1900.	Dec. 31, 1907.
W. C. Riddell.....	Secretary.....	Helena.....	Dec. 31, 1898...	Dec. 31, 1905.
George H. Barbour.	Treasurer.....	Helena.....	Dec. 31, 1899...	Dec. 31, 1906.
O. C. Evans.....	Member.....	Anaconda.....	Jan. 11, 1897...	Jan. 11, 1904.
W. H. Campbell...	Member.....	Livingston.....	Jan. 3, 1898.....	Jan. 3, 1905.
I. D. Freund.....	Member.....	Butte.....	March 27, 1901.	March 27, 1908.

STATE BOARD OF DENTAL EXAMINERS.

MEMBERS	ORGANIZATION	P. O. ADDRESS	APPOINTED	TERM EXPIRES
A. E. Myers.....	President.....	Hamilton.....	March 25, 1899	March 25, 1904.
D. J. Waite.....	Secretary.....	Helena.....	May 23, 1902....	May 23, 1907.
H. J. Wirth.....	Treasurer.....	Helena.....	March 29, 1898	March 29, 1903.
W. A. Tudor.....	Member.....	Bozeman.....	April 5, 1900....	April 5, 1905.

NATIONAL GUARD OF MONTANA.

J. K. TOOLE, Commander-in-Chief.

GENERAL STAFF.

RANK AND NAME.	OFFICE.	STATION.
Brigadier General, R. Lee McCulloch..	Adjutant General	Hamilton.
Colonel, A. L. Duncan.....	Inspector General.....	Missoula.
Lieut. Colonel, Tyler Thompson.....	Assistant Inspector General...	Missoula.
Colonel, S. E. Atkinson.....	Quartermaster General.....	Great Falls.
Colonel, Thomas B. Miller.....	Commissary General	Helena.
Colonel, George B. Owen.....	Surgeon General.....	Anaconda.
Major, J. A. Savage.....	Judge Advocate.....	Livingston.
Major, John A. Luce.....	Inspector Rifle Practice.....	Bozeman.
Lieut. Colonel, Lanier Napton.....	Aide-de-Camp.....	Butte.
Lieut. Colonel, Harvey Bliss.....	Aide-de-Camp.....	Big Timber.
Lieut. Col., Lyndsay B. Jobb.....	Aide-de-Camp.....	White Sulphur Sp

SOLDIERS' HOME, COLUMBIA FALLS.

BOARD OF MANAGERS.

MEMBERS	ORGANIZATION	P. O. ADDRESS	APPOINTED	TERM EXPIRES
C. B. Miller.....	President.....	Helena.....	April 21, 1900..	April 18, 1903.
Martin Maginniss..	Secretary.....	Helena.....	Sept. 30, 1902..	Sept. 1, 1905.
Albert Ingraham...	Member.....	Kallispell.....	March 1, 1901..	March 1, 1905.
John L. Sloan	Member.....	Missoula.....	April 15, 1899...	April 18, 1903.
A. N. Bull.....	Member.....	Bozeman.....	Ex-officio.....	

Capt. H. S. Howell, Commandant at Home.

UNITED STATES PENSION BOARD.
Meets first and third Wednesdays each month.

MEMBERS.	ORGANIZATION.	P. O. ADDRESS.
C. A. Perrin.....	President.....	Helena.
F. M. Hillyer.....	Secretary.....	Helena.

STATE INSANE ASYLUM.

TITLE.	LOCATION.	LOCATED BY.	Contractors.
State Insane Asylum..	Warm Springs.....	Not Located....	Mitchell & Mussigbrod

STATE PRISON.

TITLE.	LOCATION.	LOCATED BY.	Contractors.
Western State Prison	Deer Lodge.....	Act approved March 3, 189	Conley & McTague.

STATE BOARD OF SHEEP COMMISSIONERS.

COUNTY.	COMMISSIONER.	P. O. ADDRESS.
Beaverhead	James P. Murray.....	Dillon.
Boadwater	R. N. Clendenin.....	Townsend.
Cascade.....	Frank Reid	Great Falls.
Carbon	David Smethurst.....	Red Lodge.
Choteau.....	C. B. Toole.....	Gold Butte.
Custer	Frank O'Neill.....	Miles City.
Dawson	William Lindsay	Glendive.
Deer Lodge	Henry Davis.....	Anaconda.
Fergus	David Hilger	Lewistown.
Flathead	William Mulaney	Kalispell.
Gallatin.....	John Work	Bozeman.
Granite	Edward Lannan.....	Granite.
Jefferson	Edward Cardwell.....	Boulder.
Lewis and Clarke.....	T. C. Power.....	Helena.
Madison	S. R. Buford.....	Virginia City.
Meagher	D. R. Folsom	W. S. Springs.
Missoula	David Maclay.....	Lo Lo.
Park	S. O. N. C. Brady.....	Myersburg.
Powell	William Williams.....	Deer Lodge.
Ravalli.....	J. L. Humble.....	Covallis.
Rosebud	David McGilbray	Sabra. ..
Sweet Grass	James Vestal	Big Timber.
Silver Bow	F. C. Miles.....	Silver Bow.
Teton	W. K. Flowerree.....	Lowry.
Valley	L. H. Mills.....	Saco.
Yellowstone	P. B. Moss.....	Billings.

DEPUTY SHEEP INSPECTORS.

COUNTY.	INSPECTOR.	ADDRESS.
Beaverhead	L. E. Thomas.....	Dillon.
Broadwater	C. W. Cook.....	Unity.
Cascade.....	Frank L. Clark.....	Red Lodge.
Carbon	H. H. Nelson.....	Cascade.
Choteau.....	D. A. Smith.....	Hinsdale.
Custer	Dan H. Bowman.....	Knowlton.
Dawson	Joel Gleason.....	Glendive.
Deer Lodge .....	.....	.....
Fergus	David Hilger	Lewistown.
Flathead .....	.....	.....
Gallatin.....	John F. Work.....	Bozeman.
Granite	Alex Wight	Stone.
Jefferson .....	.....	.....
Lewis and Clarke.....	.....	.....
Madison	L. S. Briggs.....	Ennis.
Meagher	C. W. Cook	Unity.
Missoula	Dr. G. T. McCullough.....	Missoula.
Park	J. W. Van Doren.....	Livingston.
Powell .....	.....	.....
Ravalli.....	.....	.....
Rosebud	Andrew Tadsen.....	Forsyth.
Silver Bow	Dr. J. D. McGregor.....	Butte.
Sweet Grass	Charles McDonald.....	Melville.
Teton	J. K. Stauffer.....	Cut Bank.
Valley	D. A. Smith.....	Hinsdale.
Yellowstone	J. F. Platt.....	Billings.

STATE BOARD OF STOCK COMMISSIONERS.

COUNTIES.	NAME.	
Beaverhead	M. Barret	Dillon.
Broadwater	F. J. Keene	Canton.
Carbon	J. N. Tolman.....	Red Lodge.
Cascade.....	Jacob Sieben.....	Cascade.
Choteau.....	C. J. McNamara.....	Big Sandy.
Custer	O. C. Cato.....	Miles City.
Dawson	F. P. Fleming.....	Glendive.
Deer Lodge	D. D. Walker	Anaconda.
Fergus	Oscar Stevens.....	Lewistown.
Flathead	J. A. Ford	Kalispell.
Gallatin.....	H. H. Sappington.....	Sand Creek.
Granite	A. A. McDonald.....	Philipsburg.
Jefferson	John Flaherty.....	Boulder.
Lewis and Clarke.....	J. T. Murphy.....	Helena.
Madison	J. W. Sanders	Ennis.
Meagher	Len Lewis	Lewis.
Missoula .....	.....	.....
Park	G. W. Wakefield	Livingston.
Powell	John Bielenberg	Deer Lodge.
Ravalli.....	G. W. Ward.....	Hamilton.
Rosebud	J. T. Brown	Birney.
Silver Bow .....	.....	.....
Sweet Grass	J. N. Kelly	Springdale.
Teton	W. K. Floweree.....	Sun River.
Valley	M. E. Miner.....	Malta.
Yellowstone	David Fratt.....	Billings.

J. T. Murphy, President; C. C. Smith, Clerk; W. G. Preultt, Secretary.

STOCK INSPECTORS.

H. E. Burdette.....	Chicago.
C. L. Heren.....	Chicago.
R. H. Rickard.....	South Omaha.
W. H. Roades.....	St. Paul.
W. D. Smith.....	Miles City.
G. W. Hall	Havre.
E. K. Preuitt	Helena.
J. B. Lea.....	Shelby.
John Teal	Glasgow.
J. T. Webb.....	Billings.
T. E. Nichols.....	Lewistown.
Fred Landeau	Lima.
George Twibble.....	Glendive.
C. H. Young.....	Bowler.
J. C. Anderson.....	Sioux City, Iowa.
W. C. Gilmer.....	Ennis.
J. S. Wood.....	Kirby.
C. W. Smith.....	Bozeman.
C. W. Harding.....	Musselshell.
T. H. Irvine.....	Hamilton.

United States Officials.

OFFICE.	NAME.	RESIDENCE.
Judge of U. S. District Court.....	Hiram Knowles.....	Missoula.
U. S. District Attorney.....	Carl Rasch.....	Helena.
Assistant U. S. District Attorney.....	George H. Bailey.....	Helena.
Clerk of the U. S. District Court.....	George W. Sproule.....	Helena.
Deputy Clerk of U. S. District Court..	F. H. Drake.....	Helena.
United States Marshal.....	C. F. Lloyd.....	Helena.
Surveyor General.....	E. W. Beattie.....	Helena.
Collector of the U. S. Customs.....	C. M. Webster.....	Great Falls.
Assayer U. S. Assay Office.....	B. H. Tatem.....	Helena.
Register Helena Land Office.....	F. D. Miracle.....	Helena.
Receiver Helena Land Office.....	George O. Freeman.....	Helena.
Register Bozeman Land Office.....	M. R. Wilson.....	Bozeman.
Receiver Bozeman Land Office.....	A. D. Edsall.....	Bozeman.
Register Miles City Land Office.....	Sam Gordon.....	Miles City.
Receiver Miles City Land Office.....	James M. Rhoades.....	Miles City.
Register Missoula Land Office.....	Daniel Arms.....	Missoula.
Receiver Missoula Land Office.....	E. A. Winstanley.....	Missoula.
Register Lewistown Land Office.....	Lewis W. Eldridge.....	Lewistown.
Receiver Lewistown Land Office.....	Edward Brassey	Lewistown.
Register Kalispell Land Office.....	Andrew Swaney.....	Kalispell.
Receiver Kalispell Land Office.....	John E. Lewis.....	Kalispell.
Register Great Falls Land Office	James M. Burlingame.....	Great Falls.
Receiver Great Falls Land Office.....	C. H. Benton.....	Great Falls.

COMMISSIONERS OF DEEDS FOR THE STATE OF MONTANA Jan. 1, 1903.

CALIFORNIA.

Date Issued and Name.	Address.	Expires.
Sept. 6, 1901—King, James L.....	308 California st., San Francisco....	Sept. 6, 1906.
March 10, 1902—Knox, George T.....	505 California st., San Francisco...	March 10, 1907

CONNECTICUT.

Feb. 11, 1901—Cleveland, L. W.....	69 Church st., New Haven.....	Feb. 11, 1906.
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CUBA.

Jan. 20, 1900—Jose Eugenio Marx.....	June 20, 1905.
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DISTRICT OF COLUMBIA.

July 30, 1901—Bundy, Charles S.....	317 4½ st., N. W., Washington, D. C.	July 30, 1906.
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ILLINOIS.

May 27, 1898—Foote, Mark A.....	158-174 Adams st., Chicago.....	May 27, 1903.
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MASSACHUSETTS.

Dec. 2, 1900—Adams, Charles Hall.....	23 Court st., Boston.....	Dec. 2, 1905.
Feb. 5, 1901—Jones, Edward J.....	61 Court st., Boston.....	Feb. 5, 1906.
Aug. 13, 1900—Beattie, Jr., Edward W..	141 St. James ave., Springfield.....	Aug. 13, 1905.

MARYLAND.

May 28, 1898—Reardon, G. Everett.....	101 E. Lexington st., Baltimore.....	May 28, 1903.
May 25, 1901—Fisher, Abraham H.....	16 E. Lexington st., Baltimore.....	May 25, 1906.

MISSOURI.

May 27, 1899—Parker, W. Eugene.....	Kansas City.....	May 27, 1904.
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NEW YORK.

Jan. 21, 1901—Mackay, Alfred.....	59 Cedar st., New York.....	Jan. 21, 1906.
Feb. 16, 1901—Corey, George H.....	New York.....	Feb. 16, 1906.
Sept. 24, 1901—Braman, Joseph B.....	120 Broadway, New York.....	Sept. 24, 1906.
Jan. 25, 1900—Coady, John J.....	96 Broadway, New York.....	Jan. 25, 1905.
April 23, 1900—Mitchell, Henry W.....	32 Broadway, New York.....	April 23, 1905.

PENNSYLVANIA.

Jan. 31, 1901—Taylor, Samuel L.....	Betz Building, Philadelphia.....	Jan. 31, 1906.
Sept. 21, 1901—Hunt, George W.....	623 Walnut st., Philadelphia.....	Sept. 21, 1906.
March 11, 1902—Hunt, Thomas J.....	623 Walnut st., Philadelphia.....	Mar. 11, 1907.
Jan. 6, 1902—Wurts, John S.....	1037 Real Estate Trust Bldg., Phila	Jan. 16, 1907.

PHILIPPINE ISLANDS.

Feb. 3, 1900—Allison, D. Gibbs.....	Manila.....	Feb. 3, 1905.
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GREAT BRITAIN.

March 26, 1902—Hendry J. Burke.....	London.....	Mar. 26, 1907
Sept. 3, 1901—McIldowie, Jr., George....	Belfast, Ireland.....	Sept. 3, 1906.

LIST OF UNITED STATES COMMISSIONERS, DISTRICT OF MONTANA,
January 1, 1903.

NAME	RESIDENCE	WHEN APPOINTED
Adams, W. C.....	Thompson Falls.....	March 26, 1900.
Albee, C. H.....	Bowen	Jan. 29, 1901.
Arnoux C. H.....	Browning	June 27, 1902.
Burns, J. J. G.....	Belt.....	May 23, 1902.
Badger, B. W.....	White Sulphur Springs.....	July 1, 1901.
Bailey, J. A.....	Livingston	Feb. 4, 1899.
Boyle, D. P.....	Libby	July 1, 1901.
Boyle, C. H.....	Fort Benton	Dec. 19, 1898.
Brown, Alex.....	Deer Lodge	July 13, 1899.
Brown, F. D.....	Philipsburg	Dec. 12, 1901.
Brockway, B. W.....	Malta	Oct. 1, 1902.
Calkins, C. B.....	Stevensville	March 12, 1901.
Cockrill, W. M.....	Great Falls	July 1, 1901.
Comfort, J. R.....	Twin Bridges	July 1, 1901.
Copeland, George.....	Tobacco	Dec. 3, 1901.
Covington, C. C.....	Augusta	May 14, 1902.
Cowan, W. T.....	Box Elder	Dec. 12, 1901.
Cuffe, John.....	Tobacco	April 11, 1901.
Darling, M. S.....	Pondera	May 8, 1899.
Davis, A.....	Livingston	April 10, 1901.
Davis, W. Geo.....	Sweet Grass Station	Dec. 3, 1901.
Dolenty, F. X.....	Townsend	June 13, 1902.
Eardley, J. R.....	Anaconda	July 1, 1901.
Easbey, C. F.....	Cleveland	April 8, 1902.
Elder, J. C.....	Harlem	April 8, 1902.
Everett, T. M.....	Harlem	July 1, 1901.
Frary, W. S.....	Great Falls.....	Jan. 29, 1901.
Fraser, A	Billings.....	July 1, 1901.
Flint, J. A.....	Pony.....	Oct. 3, 1902.
Garratt, E. C.....	Choteau.....	Dec. 12, 1901.
Gill, A. D.....	Landusky	March 5, 1900.
Goughnow, M. A.....	Livingston	Nov. 12, 1901.
Handel, F. W.....	Musselshell	Feb. 1, 1902.
Hansen, F. J.....	Lakeview	Jan. 29, 1901.
Jackways, C. A.....	Ovando	July 1, 1901.
James, J. W.....	Anaconda	Nov. 7, 1899.
Jewett, H. C.....	Absarokee	July 1, 1901.
Johnston, J. W.....	Gebo.....	Jan. 31, 1901.
Kerr, J. J.....	Glasgow	April 26, 1902.
Klein, F.....	Briston	May 20, 1901.
Kriedler, F. M.	Miles City	July 1, 1901.
Kuehn, W. T.....	Elliston	Nov. 19, 1902.
Lindsay, A. Y.....	Tobacco	July 1, 1901.
Lohmiller, C. B.....	Poplar	Nov. 17, 1898.
Lyle, F. W.....	Red Lodge.....	Dec. 3, 1901.
McDowell, J	Gold Butte	April 18, 1899.
McIntyre, P. J.....	Havre....	Nov. 17, 1902.
McKeown, W. F.....	Columbia Falls	April 10, 1901.
McPhearson, A. D.....	Bozeman.....	July 1, 1901.
Main, H. W.....	Main	April 8, 1902.
Magee, G. W.....	Dupuyer	Nov. 7, 1899.
Mathews, W.....	Choteau	April 9, 1901.
Mell, H. J.....	Havre	July 1, 1901.
Melum, B. M.....	Capitol	Dec. 12, 1901.
Moore, W. E.....	Philipsburg	Nov. 8, 1901.
Morris, F. J.....	Hamilton	July 1, 1901.
Musbach, J. E.....	Red Lodge	Dec. 22, 1900.
Miller, F. E.....	Crow Agency.....	April 8, 1902.
Mullenger, R. A.....	Marston	July 7, 1902.
Naughton, W. J.....	Butte	Nov. 1, 1901.
Newhall, E. B.....	Big Sandy	Aug. 1, 1898.
O'Hearn, John	Culbertson	April 8, 1902.
Penwell, D.....	White Sulphur Springs	April 9, 1901.
Pierson, G. W.....	Red Lodge	July 1, 1901.
Posten, J. D.....	Libby	July 1, 1901.
Price, L. J.....	Dillon	July 1, 1901.

LIST OF UNITED STATES COMMISSIONERS—Continued.

NAME	RESIDENCE	WHEN APPOINTED
Price, M. C.....	Whitlash.....	July 1, 1901
Pound, H. C.....	Big Timber.....	Nov. 3, 1902.
Peck, H. W.....	Garneil	Nov. 19, 1902.
Ray, J. H.....	Glendive.....	July 1, 1901.
Rhone, A. R.....	Plains.....	April 2, 1900.
Rood, C. L.....	Ridgetown	June 4, 1900.
Russell, E. C.....	Helena.....	July 1, 1901.
Sands, W. B.....	Chinook	July 1, 1901.
Scott, F. H.....	Maddux	July 1, 1901.
Solleder, G. W.....	Darby	Nov. 12, 1901.
Skillman, C. N.....	Big Timber	July 1, 1901.
Smith, W. P.....	Missoula	July 1, 1901.
Smith, W. G.....	Darby	July 1, 1901.
Smith, C. F.....	Forsyth	March 14, 1901.
Stevenson, B. R.....	Wisdom	March 3, 1902.
Sterling, F. P.....	Helena.....	March 5, 1900.
Stone, R. W.....	Bridger.....	Nov. 11, 1900.
Sullivan, Jeremiah	Fort Benton	July 1, 1901.
Stafford, C. S.....	Culbertson	July 1, 1901.
Towner, W. S.....	Chinook	July 1, 1901.
Vagg, H. A.....	Saco	Dec. 3, 1901
Warner, A. C.....	Choteau.....	July 1, 1901.
Weldy, B. B.....	Custer	July 1, 1901.
Wilson, E. W.....	Thompson Falls	July 1, 1901.
Wilson, J.....	Malta	Jan. 10, 1899.
Whitney, L.....	Joliet.....	May 14, 1902.
Woodward, F. C.....	Gebo.....	Jan. 28, 1899.
Woolridge, W. M.....	Hinsdale	April 18, 1899.

REFEREES IN BANKRUPTCY.

NO. DISTRICT AND NAME	RESIDENCE	COUNTIES IN DISTRICT	WHEN APPOINTED
1—Thompson Campbell	Butte.....	Beaverhead.....	April 8, 1900.
		Deer Lodge.....	
		Powell.....	
		Madison	
		Silver Bow.....	
2—S. A. Balliet.....	Helena	Broadwater	August 9, 1900.
		Gallatin	
		Jefferson.....	
		Lewis and Clarke	
		Meagher.....	
3—Henry A. Frith.....	Billings.....	Carbon.....	June 23, 1900.
		Custer.....	
		Dawson.....	
		Park.....	
		Sweet Grass.....	
		Yellowstone.....	
		Rosebud.....	

County Officials

LIST OF COUNTY OFFICIALS OF BEAVERHEAD COUNTY. COUNTY SEAT—DILLON.

OFFICE.	NAME AND POLITICS.	
District Judge.....	M. H. Parker.....Democrat	
Sheriff	Marmaduke Gist	Democrat
Treasurer	B. N. Stevenson.....	Republican
Clerk and Recorder	J. S. Baker.....	Republican
Assessor	A. S. Beardsley	Democrat
Clerk of District Court.....	George W. French.....	Democrat
Attorney	C. W. Robinson	Republican
Superintendent of Public Schools.....	Mae Rich	Republican
Coroner	M. A. Walker.....	Republican
Public Administrator.....	Isaiah Cashmore.....	Republican
Surveyor	Geo. R. Metlen	Democrat
County Commissioners	David Knight.....	Democrat
	Wason M. Oliver	Democrat
	Wm. Montgomery.....	Democrat
State Senator.....	James P. Murray.....	Democrat
Members House of Representatives.....	Geo. Woodworth.....	Republican
	B. F. White.....	Republican

Justices of the Peace—J. S. Vermillion, Dillon; Josephus Rich, Dillon; Chas. Retallack, Bannack; Lee Wilson, Bannack; E. H. Frances, Willis; Simeon Estes, Dillon; George Lawrence, Bowen; Frank Dries, Bowen; A. M. Madison, Deweys; Scott Galbraith, Deweys; A. P. Hemgate, Dell; John Seybold, Dell; Dan Terry, Glendale; John Nead, Hecla; Jos. Seymore, Hecla; J. M. Nessley, Grant; Isaac Rife, Redrock; John Rhins, Jackson; Chas. Wemple, Jackson; Con Bray, Lima; John A. Peat, Lima; Dennis Smith, Wisdom; Marcellus Pyle, Polaris.

LIST OF COUNTY OFFICIALS OF BROADWATER COUNTY. COUNTY SEAT—TOWNSEND.

OFFICE.	NAME AND POLITICS.	
District Judge	W. R. C. Stewart.....Republican	
Sheriff	James Munden	Republican
Treasurer	W. L. Cronk	Republican
Clerk and Recorder	William Schreiner	Republican
ASSESSOR	William Schreiner	Democrat
Clerk of District Court.....	Charles B. Doggett.....	Democrat
Attorney	Fred Bubser	Democrat
Superintendent of Public Schools.....	J. A. Matthews.....	Democrat
Coroner	Mrs. Vesta P. Walker.....	Republican
Public Administrator.....	W. T. Hazleton	Republican
Surveyor	Elmer Lytle.....	Democrat
County Commissioners.....	Jacob Titman.....	Republican
	Archie McMillan	Democrat
	W. S. Thompson	Republican
	J. W. McDonald	Republican
State Senator.....	C. A. Whipple.....	Democrat
Members House of Representatives.....	H. E. Johnson	Republican
	D. F. Williams	Republican

Justices of the Peace: G. G. Watt, Townsend; C. P. Abbott, Townsend; Albert Blake, Winston; W. E. Fisher, Winston; Charles Mounts, Radersburg; James Brady, Toston; H. L. Keene, Canton; Add Turner, Hassel; Oscar Sparta, Hassel.

LIST OF COUNTY OFFICIALS OF CARBON COUNTY.
COUNTY SEAT—RED LODGE.

OFFICE.	NAME AND POLITICS.
District Judge	Frank Henry .....Republican
Sheriff	M. W. Potter.....Republican
Treasurer	Chas. E. Wright .....Republican
Clerk and Recorder	G. L. Finley .....Democrat
Assessor	W. R. Crockett .....Republican
Clerk of District Court.....	E. E. Esselstyn.....Republican
Attorney	*S. O. Caswell .....Republican
Superintendent of Public Schools.....	Agnes B. Ross .....Democrat
Coroner	Dr. A. Butler .....Fusion
Public Administrator.....	David Smethurst .....Republican
Surveyor	F. W. Hine .....Republican
County Commissioners.....	J. J. Frank .....Republican
	W. B. Nutting .....Republican
	H. J. Smith .....Republican
State Senator.....	W. F. Meyer .....Republican
Member House of Representatives.....	J. N. Tolman.....Republican

*Contested on account of a tie vote; name is that of incumbent at time of election.

Justices of the Peace: A. D. McVey, Joliet; W. A. Sutton, Joliet; F. S. Dunham, O. S. Erickson, Reno; W. F. Gibson, A. E. Pierce, Bridger; O. E. Haskin, Harry Ellis, Absarokee; E. Chatfield, David Hawthorne, Red Lodge; R. O. Morris, Morris.

LIST OF COUNTY OFFICIALS OF CASCADE COUNTY.
COUNTY SEAT—GREAT FALLS.

OFFICE.	NAME AND POLITICS.
District Judge	Jere B. Leslie.....Democrat
Sheriff	Herman E. Benner.....Democrat
Treasurer	J. W. Roberts.....Republican
Clerk and Recorder	Fred L. Hill .....Republican
Assessor	Nat McGiffin .....Republican
Clerk of District Court.....	John T. Athey .....Republican
Attorney	R. W. Berry .....Republican
Superintendent of Public Schools.....	Martha Kearns .....Democrat
Auditor	Harry Jones .....Republican
Coroner	Dr. R. P. R. Gordon.....Republican
Public Administrator.....	J. W. Powers.....Republican
Surveyor	B. D. Whitten.....Republican
County Commissioners.....	W. D. Delphy.....Democrat
	F. D. Cooper.....Republican
	Louis Roalswick .....Republican
State Senator.....	Fletcher Maddox.....Republican
Members House of Representatives.....	Lewis J. Pearson.....Republican
	Chas. A. Wilson.....Republican
	P. B. Buchanan .....Republican
	W. H. Harrison.....Republican
	George R. Woods.....Democrat

Justices of the Peace: W. H. Race, W. H. Safford, Great Falls; P. O'Connell, A. E. Caufield, Great Falls; G. Konesky, G. Schuster, Sand Coulee; J. J. G. Burns, H. L. Des Combes, Belt; J. Moyer, B. P. Fitzpatrick, Nelhart; J. C. Lilly, Richard Otey, Barker; Luther Mills, William Allen, Cascade; W. C. Lee, Kibby; John Hops, Truly; F. C. Philbrick, Geyser; Sam Getts, G. M. Caldwell, Sun River.

EIGHTH BIENNIAL REPORT OF BUREAU

LIST OF COUNTY OFFICIALS OF CHOTEAU COUNTY.
COUNTY SEAT—FORT BENTON.

OFFICE.	NAME AND POLITICS.
District Judge	John W. Tattan .....Democrat
Sheriff	John Buckley .....Democrat
Treasurer	John C. Sullivan.....Republican
Clerk and Recorder	E. Frank Sayre.....Republican
Assessor	Arthur E. Lewis .....Republican
Clerk of District Court.....	Chas. H. Boyle.....Republican
Attorney	Chas. N. Pray.....Republican
Superintendent of Public Schools.....	May G. Flanagan.....Republican
Coroner	W. B. Pyper.....Republican
Public Administrator.....	John Neubert.....Democrat
Surveyor	A. W. Merrifield.....Republican
County Commissioners.....	Geo. F. Lewis.....Republican
	A. H. Reser .....Republican
	W. E. French .....Republican
State Senator.....	Geo. B. Bourne.....Republican
Members House of Representatives.....	James H. Rice .....Republican
	Thomas M. Everett.....Republican

Justices of the Peace: H. J. Meili, Havre; P. J. McIntyre, Havre; Geo. W. Vennum, Harlem; A. A. Olson, Harlem; Guy C. Manning, Landusky; D. L. Baird, Landusky; I. S. Frey, Chinook; Samuel Houston, Chinook; John Ryan, Big Sandy; Jere Sullivan, Fort Benton; Maurice Spangler, Chester; John McDowell, Gold Butte; Wm. Cecil, Highwood; J. W. Woodcock, Fort Benton.

LIST OF COUNTY OFFICIALS OF CUSTER COUNTY.
COUNTY SEAT—MILES CITY.

OFFICE.	NAME AND POLITICS.
District Judge	C. H. Loud .....Republican
Sheriff	W. E. Savage .....Republican
Treasurer	Geo. E. Robbins.....Republican
Clerk and Recorder	H. B. Darnall.....Republican
Assessor	E. F. Crosby .....Republican
Attorney	J. H. Johnstone.....Republican
Clerk of District Court.....	A. T. McAusland.....Republican
Superintendent of Public Schools.....	Eda E. M. Wiley.....Republican
Coroner	Jos. Bateman .....Republican
Public Administrator.....	James B. Hawkins .....Republican
Surveyor	George Scheetz.....Democrat
County Commissioners.....	M. G. Maples.....Republican
	J. W. Stith.....Republican
	C. S. Bull .....Republican
State Senator.....	Kenneth McLean.....Republican
Members House of Representatives.....	George W. Burt.....Republican
	H. N. Sykes .....Republican

Justices of the Peace: A. W. Kenney, John Gibb, Miles City; W. H. Peck, Ekalaka; A. B. Snow, Terry; Chas. C. Thompson, Capitol; I. C. Sessions, Ridge.

LIST OF COUNTY OFFICIALS OF DAWSON COUNTY.
COUNTY SEAT—GLENDDIVE.

OFFICE.	NAME AND POLITICS.
District Judge	C. H. Loud.....Republican
Sheriff	George B. Williams.....Democrat
Treasurer	Hope S. Davis.....Republican
Clerk and Recorder	R. L. Wyman.....Republican
Assessor	Anton H. Johnson.....Republican
Clerk of District Court.....	James Rivenes.....Republican
Attorney	C. C. Hurley.. ....Democrat
Superintendent of Public Schools.....	Grace A. Skinner.....Republican
Coroner	W. B. Foster.....Republican
Public Administrator.....	H. A. Sample.....Republican
Surveyor	R. R. Cummins.....Republican
County Commissioners.....	J. A. Morton .....Republican
	W. C. Gleason.....Republican
	A. M. Baird .....Republican
State Senator.....	T. P. Cullen.....Democrat
Member House of Representatives.....	George W. McCone .....Republican

Justices of the Peace: John Gillies, G. N. Burdick, Glendive; T. D. Hine, W. H. Freeman, Wibaux; A. H. Thomas, Tokna; Wm. Meadars, Sidney; E. S. Gillies, Jordan.

LIST OF COUNTY OFFICIALS OF DEER LODGE COUNTY.
COUNTY SEAT—ANACONDA.

OFFICE.	NAME AND POLITICS.
District Judge	Welling Napton .....Democrat
Sheriff	Geo. A. Storrar .....Labor
Treasurer	Harry A. Denny .....Labor
Clerk and Recorder	Phil Greenan .....Democrat
Assessor	Newton E. Leavengood.....Labor
Clerk of District Court.....	William E. Thomas.....Republican
Attorney	Joseph J. McCaffrey.....Labor
Superintendent of Public Schools.....	Alice L. Mahoney.....Labor
Coroner	Michael J. Walsh .....Labor
Public Administrator.....	John S. Wisner.....Republican
Surveyor	Patrick A. Tobin .....Labor
County Commissioners.....	James W. Geary .....Democrat
	William Kelleher .....Democrat
	Henry B. Hoffman .....Republican
State Senator.....	J. M. Kennedy.....Fusion
Members House of Representatives.....	William R. Allen.....Republican
	L. E. Beaudry.....Labor
	T. C. O'Keefe .....Labor
	J. Morrissey .....Labor
	F. Gagner .....Labor
	J. H. Swend .....Labor

Justices of the Peace: Thomas F. Murphy, Marshall B. Hendricks, Anaconda.

EIGHTH BIENNIAL REPORT OF BUREAU

LIST OF COUNTY OFFICIALS OF FERGUS COUNTY.
COUNTY SEAT—LEWISTOWN.

OFFICE.	NAME AND POLITICS.	
District Judge	Edwin K. Cheadle.....Republican	
Sheriff	L. P. Slater	Democrat
Treasurer	J. M. Croft.....	Republican
Clerk and Recorder	F. J. Hazen	Democrat
Assessor	Frank Pick.....	Democrat
Clerk of District Court.....	Edmund Wright	Republican
Attorney	O. W. Belden.....	Republican
Superintendent of Public Schools.....	Ada Meyersick	Democrat
Coroner	O. F. David	Republican
Public Administrator.....	Frank Day	Republican
Surveyor	A. Hogeland	Democrat
County Commissioners.....	Wm. T. Neill	Republican
	Samuel Phillips	Republican
	James B. Washburn	Republican
State Senator.....	John Waite	Democrat
Members House of Representatives.....	E. W. King	Republican
	David Hilger	Democrat

Justices of the Peace: P. W. Korell, Utica; J. S. Phillips, Utica; Samuel J. Flint, Garneill; W. T. McFarland, Lewistown; C. A. Norlin, Maiden; Geo. N. Caldwell, Gilt Edge; Orlando Sawyer, Gilt Edge; Geo. W. Jorden, Flat Willow; S. W. Weede, Weede.

LIST OF COUNTY OFFICIALS OF FLATHEAD COUNTY.
COUNTY SEAT—KALISPELL.

OFFICE.	NAME AND POLITICS.
District Judge	D. F. Smith .....Democrat
Sheriff	O. P. Gregg.....Republican
Treasurer	Samuel Hilburn .....Democrat
Clerk and Recorder	J. W. Walker .....Republican
Assessor	Andrew Dunsire .....Democrat
Clerk of District Court.....	James K. Lang .....Democrat
Attorney	W. H. Poorman .....Republican
Superintendent of Public Schools.....	E. A. Steere .....Republican
Coroner	N. Willoughby .....Republican
Public Administrator.....	Herman Latimer .....Republican
Surveyor	J. B. Gibson .....Republican
County Commissioners.....	Ovid Peltier .....Republican
	C. H. Brintnall .....Republican
	G. H. Adams.....Republican
State Senator.....	W. J. Brennan .....Republican
Members House of Representatives.....	J. R. Hilman .....Republican
	H. S. Cannon .....Republican
	J. M. Noble .....Republican

Justices of the Peace: Wm. S. Mills, Tobacco Plains; Alex. McDonald, Flathead Township; O. G. Cornish, Jocko; Thomas Carrol, Columbia Falls; Geo. Hathaway, Libby; Samuel L. Wallace, M. J. Sullivan, Kalispell.

LIST OF COUNTY OFFICIALS OF GALLATIN COUNTY.
COUNTY SEAT—BOZEMAN.

OFFICE.	NAME AND POLITICS.	
District Judge	W. R. C. Stewart.....Republican	
Sheriff	Thomas J. Fowler	Republican
Treasurer	Geo. W. Flanders	Republican
Clerk and Recorder	Allen Cameron	Republican
Assessor	David S. McLeod.....	Democrat
Clerk of District Court.....	Charles B. Anderson	Republican
Attorney	George D. Pease	Republican
Superintendent of Public Schools.....	Olla A. Ferguson.....	Democrat
Coroner	Taylor Trent	Republican
Public Administrator.....	Josephus P. Martin.....	Democrat
Surveyor	C. M. Thorpe	Democrat
County Commissioners.....	E. F. Sawyer	Democrat
	George E. Davis	Republican
	Thomas S. Kirk	Republican
State Senator.....	C. W. Hoffman	Democrat
Members House of Representatives....	James E. Martin	Democrat
	Nelson Story, Jr.....	Republican
	Walter Sales	Republican

Justices of the Peace: W. Y. Smith, Frank H. Mehlberg, Bozeman; E. Adams, Sedan; M. L. Thomas, Salesville; J. G. Swetland, Belgrade; Oliver Scow, Manhattan; B. N. Smith, Logan.

LIST OF COUNTY OFFICIALS OF GRANITE COUNTY.
COUNTY SEAT—PHILIPSBURG.

OFFICE.	NAME AND POLITICS.
District Judge	Welling Napton .....Democrat
Sheriff	F. J. McDonald.....Democrat
Treasurer	Walter W. Kroger.....Fusion
Clerk and Recorder.....	John Neu Fusion
Assessor	William Enderlein Fusion
Clerk of District Court.....	James E. Abbey Fusion
Attorney	D. M. Durfee .....Democrat
Superintendent of Public Schools.....	M. C. Ryan Fusion
Coroner	R. W. Getty Fusion
Public Administrator	J. A. Matthews Fusion
Surveyor	E. A. Cralle .....Democrat
County Commissioners.....	Joseph Henderson Fusion
	John W. Duffy Fusion
	Albert Rupp .....Democrat
State Senator	Geo. P. Durham .....Democrat
Members House of Representatives....	Henry W. Lehsou.....Republican
	Samuel Arthur .....Democrat

Justices of the Peace: Charles B. Bust, Cyrus K. Wyman, Philipsburg; Peter Gallagher, Granite; Lewis Stroh, Granite; R. H. Childs, G. W. Commons, Garnet; Thomas Botscheider, C. C. Spences, Sunrise; Otto Neubert, New Chicago; D. H. Mellen, Stone.

EIGHTH BIENNIAL REPORT OF BUREAU

LIST OF COUNTY OFFICIALS OF JEFFERSON COUNTY.
COUNTY SEAT—BOULDER.

OFFICE.	NAME AND POLITICS.
District Judge	M. H. Parker .....Democrat
Sheriff	A. V. Gibson .....Republican
Treasurer	E. W. Burdick.....Republican
Clerk and Recorder.....	Charles Scharf .....Democrat
Assessor	John T. Murphy .....Democrat
Clerk of District Court.....	A. J. Holloway.....Democrat
Attorney	C. R. Stranahan .....Republican
Superintendent of Public Schools.....	Alma Kriger .....Republican
Coroner	Andrew Less .....Democrat
Public Administrator	Z. N. Thompson .....Democrat
Surveyor	R. M. Cralle .....Democrat
County Commissioners.....	Edward Ryan .....Democrat
	A. H. Moulton .....Democrat
	Wm. Fergus .....Democrat
State Senator	Henry L. Sherlock.....Democrat
Members House of Representatives....	John Flaherty .....Democrat
	Timothy Downey .....Democrat
	Duncan A. McDonald .....Republican

Justices of the Peace: I. V. Baker, Casimir Kamber, Clancy; W. D. Talbot, Jefferson City; S. A. Robertson, J. W. Eastridge, Boulder; Z. D. Foster, Edwin Cooley, Whitehall; James Wali, H. O. Johnson, Basin; William Simon, R. N. Rand, Woodville; T. C. Glora, M. J. Garrity, Homestake.

LIST OF COUNTY OFFICIALS OF LEWIS AND CLARKE COUNTY.
COUNTY SEAT—HELENA.

OFFICE.	NAME AND POLITICS.
District Judge	Henry C. Smith .....Republican
	J. M. Clements.....Populist
Sheriff	Jefferson O'Connell.....Democrat
Treasurer	W. M. G. Settles.....Democrat
Clerk and Recorder.....	Sidney Miller .....Democrat
Assessor	Charles H. Martien .....Democrat
Attorney	Lincoln Working .....Republican
Clerk of District Court.....	Finlay McRae .....Democrat
Superintendent of Public Schools.....	Ida Fullerton .....Republican
Auditor	Daniel Sweeney .....Democrat
Coroner	A. P. Yeager .....Republican
Public Administrator	Samuel Schwab .....Republican
Surveyor	John H. Farmer .....Republican
County Commissioners.....	W. O. Hutchinson .....Democrat
	W. B. Hundley .....Democrat
	F. J. Wegner .....Democrat
State Senator	Wesley M. Biggs .....Democrat
Members House of Representatives....	Dr. O. M. Lanstrum.....Republican
	Fred Benson .....Republican
	Dr. C. B. Miller .....Republican
	Charles H. Bray .....Republican
	Lewis Stadler .....Republican
	John B. Wilson .....Republican
	C. F. Word .....Democrat

Justices of the Peace: Frederick E. Tibbetts, Frank L. Reece, Helena; Milton Canby, East Helena; Thomas Gibson, Ralph Wells, Craig; Geo W. Padbury, L. L. Lush, Marysville; H. E. Simpson, G. D. Flesher, Lincoln; C. C. Covington, J. C. Turman, Augusta; S. D. French, York.

LIST OF COUNTY OFFICIALS OF MADISON COUNTY.
COUNTY SEAT—VIRGINIA CITY.

OFFICE.	NAME AND POLITICS.
District Judge	M. H. Parker.....Democrat
Sheriff	Charles C. Hill .....Democrat
Treasurer	George E. Gohn .....Republican
Clerk and Recorder.....	John Z. Clem .....Republican
Assessor	W. A. Stevenson .....Republican
Clerk of District Court.....	James G. Walker .....Democrat
Attorney	M. M. Duncan .....Democrat
Superintendent of Public Schools.....	Grace M. Baker .....Republican
Coroner	A. M. Dwight .....Republican
Public Administrator	Clark W. Kellogg .....Republican
Surveyor	Dwight Bushnell .....Republican
County Commissioners.....	O. B. Varney .....Democrat
	E. D. Marsh .....Republican
	R. N. Hawkins .....Democrat
State Senator	Jacob Albright .....Republican
Members House of Representatives....	F. B. Linderman .....Republican
	Thomas H. Teal .....Republican
	John H. Miles .....Republican

Justices of the Peace: J. E. Dickey, Rochester; H. N. Virden, Twin Bridges; B. F. Bowman, Sheridan; P. B. Kelley, Alder; Levi Shambow, Lake View; W. D. Johnson, Virginia City; Davis W. Lindsay, Meadow Creek; John Vanderbilt, Norris; William T. Simpson, Pony.

LIST OF COUNTY OFFICIALS OF MEAGHER COUNTY.
COUNTY SEAT—WHITE SULPHUR SPRINGS.

OFFICE.	NAME AND POLITICS.
District Judge	W. R. C. Stewart.....Republican
Sheriff	Charles H. Sherman.....Independent
Treasurer	Alex Gibson .....Republican
Clerk and Recorder.....	George W. Harden.....Republican
Assessor	E. W. Ray .....Democrat
Clerk of District Court.....	B. W. Badger .....Republican
Attorney	Max Waterman .....Republican
Superintendent of Public Schools.....	Blanche Welliver .....Republican
Coroner	John D. Shorey .....Republican
Public Administrator	J. A. Wiltse .....Democrat
Surveyor	Otis Godfrey .....Republican
County Commissioners.....	M. T. Grande .....Republican
	Charles B. Catlin .....Republican
	Herbert Holloway .....Republican
State Senator	Elmer J. Anderson .....Republican
Members House of Representatives....	Harry J. Giltinan.....Republican
	Clarence P. Tooley.....Republican

Justices of the Peace: Ed. L. Allen, J. E. Lippincott, White Sulphur Springs; Ed Odell, Copper; Albert Hangan, Lennop; William Woods, Two Dot; J. E. Lane, Harlowton.

LIST OF COUNTY OFFICIALS OF MISSOULA COUNTY.
COUNTY SEAT—MISSOULA.

OFFICE.	NAME AND POLITICS.
District Judge.....	Frederick C. Webster.....Republican
Sheriff	Harry W. Thompson.....Republican
Treasurer	Dan J. Heyfron.....Democrat
County Clerk and Recorder.....	George Pringle
Assessor	Paul Wagnitz
Clerk of District Court.....	R. W. Kemp.....Republican
County Attorney	Charles H. Hall.....Democrat
Superintendent of Public Schools.....	Kate Shelly.....Democrat
Coroner	John M. Lucey.....Democrat
Public Administrator.....	John E. Moody.....Republican
County Surveyor	A. W. Catlin.....Republican
Auditor.....	L. M. Coleman.....Republican
County Commissioners	John Bonner
	Peter Scheffer
	August Hollensteiner
State Senator	Ed Donlan.....Republican
Members of House of Representatives ..	Chas. M. Owen.....Republican
	Davis Graham
	James M. Self.....Republican
	Reuben Dwight.....Republican

Justices of the Peace: Wm. Hayes, J. T. Phillips, Missoula; John Meany, Hugh Stevens, Plains; E. W. Wilson, E. J. Thompson, Thompson; Thomas H. Corbett, Frenchtown; Wm. Streeter, Superior; E. Rogers, St. Regis.

LIST OF COUNTY OFFICIALS OF PARK COUNTY.
COUNTY SEAT—LIVINGSTON.

OFFICE.	NAME AND POLITICS.
District Judge.....	Frank Henry.....Republican
Sheriff	A. S. Robertson.....Republican
Treasurer	Harry McCue.....Democrat
County Clerk and Recorder.....	Charles Angus
Assessor	J. H. Proffitt
Clerk of District Court.....	A. C. Davis, Jr.....Republican
County Attorney	A. P. Stark.....Republican
Superintendent of Public Schools.....	Mrs. Nora Colvin.....Democrat
Coroner	S. E. Leard
Public Administrator.....	C. O. Krohne.....Republican
County Surveyor	S. H. Crookes
County Commissioners	N. Ebert.....Democrat
	Albert Trager.....Republican
	F. A. Krieger.....Republican
State Senator	J. N. Conrow.....Democrat
Members of House of Representatives..	C. S. Hefferlin
	T. M. Swindlehurst.....Democrat

Justices of the Peace: Frank Bender, Peter Wendell, Livingston; M. M. Black, Fridley; John Dewing, Horr; Andrew Pisch, Aldridge; Frank A. Pratt, Gardiner; Thomas Harden, Cooke; George H. Phelps, Charles Acklemire, Jardine; W. J. Hobbs, Chico; John Uhl, Clyde Park.

LIST OF COUNTY OFFICIALS OF POWELL COUNTY.
COUNTY SEAT—DEER LODGE.

OFFICE.	NAME AND POLITICS.
District Judge.....	Welling Napton .....Democrat
Sheriff	J. C. Barnden.....Republican
Treasurer	A. D. Peck.....Republican
County Clerk and Recorder.....	W. E. Evans.....Republican
Assessor	R. N. Tibbetts .....Republican
Clerk of District Court.....	R. Lee Kelley.....Republican
County Attorney	O. E. Emerson.....Independent
Superintendent of Public Schools.....	Mollie E. Wilds.....Democrat
Coroner	Nathan Smith .....Republican
Public Administrator.....	Daniel Dunnigan .....Republican
County Surveyor	W. E. Fisher.....Republican
County Commissioners	Geo. Cockrell .....Democrat
	H. H. Zenor.....Republican
	T. B. Mannix.....Republican
State Senator	Conrad Kohrs.....Republican
Member of House of Representatives....	H. J. Faust .....Republican

Justices of the Peace: Thomas W. Catlin, John Y. Batterton, Deer Lodge; W. W. Case, Gold Creek; A. C. Glover, W. H. Bailey, Ophir Township; A. O. Goodfellow, Elmer Ellsworth, Lincoln; B. A. C. Stone, Elk Township.

LIST OF COUNTY OFFICIALS OF RAVALLI COUNTY.
COUNTY SEAT—HAMILTON.

OFFICE.	NAME AND POLITICS.
District Judge.....	F. C. Webster.....Republican
Sheriff	Joshua Pond.....Democrat
Treasurer	Harvey L. Carter.....Democrat
County Clerk and Recorder.....	Charles M. Johnson.....Republican
Assessor	Arthur Beckwith.....Republican
Clerk of District Court.....	John F. Cone.....Republican
County Attorney	Wm. P. Baker
Superintendent of Public Schools.....	Kittie Ostermeyer.....Republican
Coroner	Frank M. Lockwood .....Republican
Public Administrator.....	John Campbell.....Democrat
County Surveyor	M. D. Kippen.....Democrat
County Commissioners	J. B. Overturf .....Republican
	Henry Grover.....Democrat
	Geo. Satterlee .....Democrat
State Senator	Ed A. Johnson.....Democrat
Members of House of Representatives..	Aaron Connor.....Republican
	J. W. Lancaster.....Republican

Justices of the Peace: F. B. Tanner, Darby; Sylvester Irvine, Grantsdale; Frank J. Morris, Hamilton; J. B. Laws, Corvallis; Geo. Gibbons, Stevensville.

LIST OF COUNTY OFFICIALS OF ROSEBUD COUNTY.
COUNTY SEAT—FORSYTH.

OFFICE.	NAME AND POLITICS.
District Judge.....	Charles H. Loud .....Republican
Sheriff	*Robert J. Guy.....Republican
Treasurer	T. W. Longley.....Democrat
County Clerk and Recorder.....	C. W. Bailey.....Democrat
Assessor	James B. Grierson.....Republican
Clerk of District Court.....	D. J. Muri .....Republican
County Attorney	F. L. Gibson.....Republican
Superintendent of Public Schools.....	Gertrude M. Higgins.....Democrat
Coroner	
Public Administrator.....	R. W. Snook .....Republican
County Surveyor	Chas. B. Tabor.....
County Commissioners	N. J. Humphrey.....Democrat
	Thomas Alexander .....Democrat
	M. Schlitz.....Republican
State Senator	J. S. Hopkins.....Democrat
Member of House of Representatives....	William Bray.....Republican

*Appointed by County Commissioners.
Justices of the Peace: Olaf Henderson, G. S. Mendenhall.

LIST OF COUNTY OFFICIALS OF SILVER BOW COUNTY.
COUNTY SEAT—BUTTE.

OFFICE.	NAME AND POLITICS.
District Judges.....	William Clancy .....Populist
	E. W. Harney.....Fusion
	J. B. McClernan.....Fusion
Sheriff	J. J. Quinn.....Fusion
Treasurer	James Maher.....Fusion
County Clerk and Recorder.....	John Weston.....Fusion
Assessor	Dan Brown .....Fusion
Clerk of District Court.....	Samuel M. Roberts.....Democrat
County Attorney	Peter Breen .....Fusion
Superintendent of Public Schools.....	Margaret Loughlin .....Fusion
Auditor	A. A. Crossman.....Fusion
Coroner	Michael Egan.....Democrat
Public Administrator.....	John Melville.....Democrat
County Surveyor	Alfred Frank.....Fusion
County Commissioners	Wm. D. Clark.....Populist
	Michael P. Haggerty.....Labor
	Pat Peoples .....Populist
State Senator	Daniel Tewey.....Fusion
Members of House of Representatives..	John McGinniss .....Fusion
	Pat Mullins.....Fusion
	J. H. Lynch .....Fusion
	G. W. Stapleton .....Fusion
	Joseph Shannon .....Fusion
	Louis Lienemann.....Fusion
	Lawrence Duggan.....Fusion
	R. W. Farmer.....Fusion
	F. J. Pelletier.....Fusion
	Charles W. Dempster.....Fusion
	F. B. Axtell.....Fusion
	W. F. Whiteley.....Fusion

Justices of the Peace Silver Bow Township: John Doran, Timothy P. Harrington, Butte. Walkerville Township: Patrick Colligan, Edward Sheehan, Walkerville. South Butte Township: Phil J. Harrington, Cornelius Taylor, South Butte. Meaderville Township: H. S. Libby, George F. Danzer, Gunderson. Red Mountain Township, a tie; no election: J. W. Bruce, E. H. Harvey, M. D. Post, John Trainor, Melrose. German Township: Milo French, George Kessler, Gregson.

LIST OF COUNTY OFFICIALS OF SWEET GRASS COUNTY.
COUNTY SEAT—BIG TIMBER.

OFFICE.	NAME AND POLITICS.	
District Judge.....	Frank Henry.....	Republican
Sheriff	O. A. Fallang	Republican
Treasurer	J. W. Geiger.....	Republican
County Clerk and Recorder.....	Harry Allen.....	Republican
Assessor	Ralph S. Jarrett.....	Republican
Clerk of District Court.....	Ben M. Mjelde.....	Democrat
County Attorney	E. M. Hall	Republican
Superintendent of Public Schools.....	Alice M. Webster.....	Republican
Coroner		
Public Administrator.....	A. G. Yule	Republican
County Surveyor	D. J. Walvoord.....	Republican
County Commissioners	Francis Irvin.....	Republican
	O. B. Nevin.....	Republican
	R. J. McConnell.....	Republican
State Senator	J. N. Kelly.....	Republican
Member of House of Representatives...	Robert Brownlee.....	Republican

Justices of the Peace: H. C. Pond, T. E. Rice, Big Timber; P. H. Carlton, Merrill; Ed. Edam, E. H. Ellingson, Melville; L. Eckwartzel, Stillwater.

LIST OF COUNTY OFFICIALS OF TETON COUNTY.
COUNTY SEAT—CHOTEAU.

OFFICE.	NAME AND POLITICS.
District Judge.....	D. F. Smith.....Democrat
Sheriff	C. Wallace Taylor.....Democrat
Treasurer	John S. Gordon.....Republican
County Clerk and Recorder.....	Alfred C. Warner.....Republican
Assessor	T. O. Larson.....Republican
Clerk of District Court.....	Sterling McDonald.....Republican
County Attorney	J. E. Erickson.....Democrat
Superintendent of Public Schools.....	*Fannie E. Chenowith.....Republican
Coroner	William H. Stearns.....Republican
Public Administrator.....	William H. Franklin.....Republican
County Surveyor	John W. Sheilds.....Republican
County Commissioners	William Cowgill.....Republican
	Ed Bollerud.....Republican
	Ed. Dennis.....Democrat
State Senator	S. F. Ralston, Jr.....Democrat
Member of House of Representatives....	Jonathan E. Webb.....Republican

*Contested on account of tie vote. Name is that of incumbent at time of election.

Justices of the Peace: J. E. D. Haas, Nat Collins, Choteau; Thomas W. Lett, Ben Short, Dupuyer; Wm. W. Parott, Wm. Dawes, Shelby; Ed. A. Mathews, Pailey Stark, Altyn.

LIST OF COUNTY OFFICIALS OF VALLEY COUNTY.
COUNTY SEAT—GLASGOW.

OFFICE.	NAME AND POLITICS.
District Judge.....	John W. Tattan.....Democrat
Sheriff	Harry Cosner.....Democrat
Treasurer	S. C. Small.....Democrat
County Clerk and Recorder.....	R. J. Crossett.....Republican
Assessor	James Fox.....Republican
Clerk of District Court.....	John Survant.....Independent
County Attorney	John J. Kerr.....Republican
Superintendent of Public Schools.....	Lear A. Humphrey.....Republican
Coroner	M. F. Chester.....Republican
Public Administrator.....	James Tweedie.....Republican
County Surveyor	T. M. Patten.....Republican
County Commissioners	L. W. Gibson.....Republican
	L. H. Mills.....Republican
	S. P. Mitchell.....Democrat
State Senator	A. W. Mahon.....Democrat
Member of House of Representatives...	Harry A. Vagg.....Republican

Justices of the Peace: D. C. Kenyon, Malta; J. F. Murray, Malta; J. B. Northrup, Saco; G. W. Rapp, G. H. Coulter, Glasgow; William Jackson, Culbertson; A. R. Chapman, Culbertson.

LIST OF COUNTY OFFICIALS OF YELLOWSTONE COUNTY.
COUNTY SEAT—BILLINGS.

OFFICE.	NAME AND POLITICS.
District Judge	C. H. Loud.....Republican
Sheriff	George W. Hubbard.....Democrat
Treasurer	Gwen F. Burla
Clerk and Recorder.....	John W. Fish.....Republican
Assessor	Warren A. Evans.....Republican
Clerk of District Court.....	T. A. Williams.....Democrat
Attorney	Charles L. Harris.....Republican
Superintendent of Public Schools.....	Margaret M. Strang.....Republican
Coroner	Joseph H. Rinehart.....Republican
Public Administrator	O. D. Hogue.....Republican
Surveyor	A. A. Morris.....Republican
County Commissioners.....	C. M. Jacobs.....Democrat
	W. O. Parker.....Republican
	S. K. Deverill
State Senator	Christian Yegen.....Republican
Members House of Representatives...	C. M. Bever.....Republican

Justices of the Peace: F. L. Mann, Alex Fraser, Billings; E. W. Peck, Wm. McMorris, Park City; P. H. Hawkins, S. W. Porter, Columbus; Frank Scott, John R. Ramsey, Junction; S. H. Erwin, Round Up; H. W. Ostrander, F. W. Handel, Musselshell.

Postoffices in Montana.

Absarokee	Carbon	Cable	Powell
Ada	Choteau	Camas	Missoula
Adel	Cascade	Cameron	Madison
Alder	Madison	Canton	Broadwater
Adobetown	Madison	Canyon Creek	Lewis and Clarke
Albright	Cascade	Canyon Ferry	Lewis and Clarke
Aldridge	Park	Capitol	Custer
Alhambra	Jefferson	Carlton	Missoula
Alma	Choteau	Cascade	Cascade
Alpine	Fergus	Castle	Meagher
Alta	Ravalli	Cedarview	Gallatin
Altyn	Teton	Central Park	Gallatin
Alzada	Custer	Chance	Carbon
Anaconda (C. H.)	Deer Lodge	Chautauqua	Flathead
Argenta	Beaverhead	Chestnut	Gallatin
Arlee	Missoula	Chester	Choteau
Armells	Fergus	Chico	Park
Armington	Cascade	Chimney Rock	Park
Ashland	Rosebud	Chinook	Choteau
Augusta	Lewis and Clarke	Choteau (C. H.)	Teton
Austin	Lewis and Clarke	Christina	Fergus
Avon	Deer Lodge	Cinnabar	Park
Baeth	Valley	Clancy	Jefferson
Baird	Missoula	Clearwater	Powell
Bald Butte	Lewis and Clarke	Clemons	Lewis and Clarke
Baldwin	Fergus	Cleveland	Choteau
Bannack	Beaverhead	Cliff	Powell
Barker	Cascade	Clinton	Missoula
Basin	Jefferson	Clipper	Madison
Bearmouth	Granite	Clyde Park	Park
Beatrice	Choteau	Coberg	Choteau
Beebe	Custer	Coburn	Crow Indian Reservation
Belgrade	Gallatin	Cold Spring	Jefferson
Bellevue	Teton	Coloma	Powell
Belt	Cascade	Columbia Falls	Flathead
Belton	Flathead	Columbus	Yellowstone
Bercail	Fergus	Como	Ravalli
Bernice	Jefferson	Contact	Park
Big Elk	Meagher	Cooke	Park
Big Fork	Flathead	Copper	Meagher
Big Sandy	Choteau	Cora	Cascade
Big Timber (C. H.)	Sweet Grass	Corbin	Jefferson
Billings (C. H.)	Yellowstone	Corvallis	Ravalli
Birdseye	Lewis and Clarke	Cottonwood	Fergus
Birney	Rosebud	Cowles	Park
Blaine	Madison	Craig	Lewis and Clarke
Blanchard	Missoula	Creston	Flathead
Blackman	Dawson	Crow Agency	Crow Reservation
Blatchford	Custer	Culbertson	Valley
Bonita	Missoula	Cut Bank	Teton
Bonner	Missoula	Darby	Ravalli
Boulder (C. H.)	Jefferson	Dayton	Flathead
Bowen	Beaverhead	Dean	Carbon
Bowler	Carbon	Deborgia	Missoula
Box Elder	Choteau	Decker	Rosebud
Boyle	Custer	Deer Lodge (C. H.)	Powell
Bozeman (C. H.)	Gallatin	Dell	Beaverhead
Brandenburg	Custer	Delphine	Meagher
Bridger	Carbon	Denton	Fergus
Brighton	Teton	Desmet	Missoula
Briston	Beaverhead	Dewey	Beaverhead
Broadus	Custer	Diamond City	Broadwater
Browning	Teton	Dillon (C. H.)	Beaverhead
Bruffeys	Park	Divide	Silver Bow
Burlington	Silver Bow	Dodson	Choteau
Butte (C. H.)	Silver Bow	Dorsey	Meagher
Bynum	Teton	Dragseth	Custer

Drummond	Granite	Grantsdale	Ravalli
Dupuyer	Teton	Grassrange	Fergus
East Helena	Lewis and Clarke	Grayling	Gallatin
Echo	Flathead	Great Falls (C. H.).....	Cascade
Eddy	Missoula	Gregson	Silver Bow
Eden	Cascade	Greene	Fergus
Edgewater	Fergus	Grey Cliff	Sweet Grass
Ekalaka	Custer	Gunderson	Silver Bow
Elizabeth	Teton	Gunton	Fergus
Elkhorn	Jefferson	Halbert	Fergus
Elk Park	Jefferson	Hall	Granite
Elliston	Powell	Hamilton (C. H.).....	Ravalli
Elso	Fergus	Hardy	Cascade
Emery	Deer Lodge	Harlem	Choteau
Enid	Dawson	Hassel	Broadwater
Ennis	Madison	Hathaway	Rosebud
Ericson	Custer	Havre	Choteau
Essex	Flathead	Hawkwood	Park
Etna	Custer	Hays	Choteau
Evans	Cascade	Helena (C. H.).....	Lewis and Clarke
Everson	Fergus	Helmville	Powell
Ewing	Carbon	Hepler	Cascade
Fallon	Custer	Heron	Missoula
Family	Teton	Highfield	Fergus
Farmington	Teton	Highwood	Choteau
Feely	Silver Bow	Hill	Choteau
Fergus	Fergus	Hinsdale	Valley
Ferguson	Madison	Hockett	Custer
Fishtail	Carbon	Hodges	Dawson
Fishtrap	Silver Bow	Hoffman	Park
Five Mile	Custer	Hogan	Lewis and Clark
Flatwillow	Fergus	Holt	Flathead
Flesher	Lewis and Clarke	Home Park	Madison
Florence	Ravalli	Homestake	Jefferson
Folsom	Fergus	Horr	Park
Forest	Missoula	Horton	Custer
Forsyth (C. H.).....	Rosebud	Houskin	Cascade
Ft. Assiniboine	Choteau	Howard	Rosebud
Ft. Benton (C. H.).....	Choteau	Howie	Sweet Grass
Ft. Custer	Crow Reservation	Hunter's Hot Springs.....	Park
Ft. Keogh	Custer	Huntley	Yellowstone
Ft. Logan	Meagher	Huson	Missoula
Ft. Maginnis	Fergus	Hyde	Gallatin
Fox	Beaverhead	Irene	Fergus
Frenchtown	Missoula	Iron Mountain	Missoula
Fridley	Park	Jackson	Beaverhead
Fulton	Lewis and Clarke	Jardine	Park
Galata	Choteau	Jefferson City	Jefferson
Gateway	Flathead	Jefferson Island	Jefferson
Gallop	Gallatin	Jennings	Flathead
Gardiner	Park	Jocko	Missoula
Garland	Custer	Johnson	Broadwater
Garneill	Fergus	Joliet	Carbon
Garnet	Granite	Jordan	Dawson
Garrison	Powell	Josephine	Gallatin
Gebo	Carbon	Judith	Fergus
Geer	Cascade	Junction	Yellowstone
Geysers	Cascade	Kalispell (C. H.).....	Flathead
Giltedge	Fergus	Kenneth	Valley
Glasgow (C. H.)	Valley	Kibbey	Cascade
Glen	Flathead	Kiehl	Carbon
Glendive (C. H.)	Dawson	Kingsley	Custer
Glenrock	Custer	Kinsey	Custer
Glenwood	Broadwater	Kipp	Teton
Gold Butte	Choteau	Kirby	Rosebud
Gold Creek	Powell	Kismet	Dawson
Golden	Carbon	Knerville	Choteau
Gould	Lewis and Clarke	Knowlton	Custer
Graham	Custer	Lakeview	Madison
Granite	Granite	Lamedeer	Rosebud
Grant	Beaverhead	Landusky	Choteau

Lasalle	Flathead	Nine Mile	Missoula
Lat	Park	Norris	Madison
Laurel	Yellowstone	Nye	Sweet Grass
Laurin	Madison	Oka	Meagher
Lavina	Fergus	Orr	Cascade
Lee	Rosebud	Oswego	Valley
Lennop	Meagher	Otis	Rosebud
Lewis	Meagher	Otter	Custer
Lewistown (C. H.)	Fergus	Ovando	Powell
Libby	Flathead	Pageville	Madison
Lima	Beaverhead	Park City	Yellowstone
Limespur	Jefferson	Parrot	Madison
Lincoln	Lewis and Clarke	Philbrook	Fergus
Linley	Carbon	Philipsburg (C. H.)	Granite
Livingston (C. H.)	Park	Phillips	Choteau
Lloyd	Choteau	Pioneer	Powell
Lock	Rosebud	Pinegrove	Fergus
Lockhart	Jefferson	Pipestone* Springs	Jefferson
Lodgegrass	Crow Reservation	Plains	Missoula
Logan	Gallatin	Plentywood	Valley
Lo Lo Hot Springs	Missoula	Polaris	Beaverhead
Lombard	Broadwater	Polson	Flathead
Lothrop	Missoula	Pondera	Teton
Lowry	Teton	Pony	Madison
Lucile	Choteau	Poplar	Valley
Lyon	Madison	Potomac	Missoula
Lytle	Choteau	Powderville	Custer
McAllister	Madison	Preston	Custer
McKay	Custer	Princeton	Granite
McLeod	Sweet Grass	Pryor	Crow Reservation
McMillan	Dawson	Puller Springs	Madison
Maddux	Choteau	Pyrates	Ravalli
Maiden	Fergus	Quartz	Missoula
Malta	Valley	Race Track	Powell
Mammoth	Madison	Radersburg	Broadwater
Manhattan	Gallatin	Rancher	Rosebud
Marlas	Choteau	Ravalli	Missoula
Marston	Flathead	Raymond	Teton
Martina	Missoula	Red Lodge (C. H.)	Carbon
Martinsdale	Meagher	Red Rock	Beaverhead
Marysville	Lewis and Clarke	Reed	Sweet Grass
Maudlow	Gallatin	Riceville	Cascade
Meadow Creek	Madison	Ridge	Custer
Melrose	Silver Bow	Ridglawn	Dawson
Melville	Sweet Grass	Rimini	Lewis and Clarke
Merrill	Sweet Grass	River	Flathead
Meyersburg	Park	Roberts	Carbon
Midcanon	Cascade	Rochester ..	Madison
Midland	Custer	Rock Creek	Park
Midvale	Teton	Rockford	Fergus
Milk River	Valley	Rockvale	Carbon
Miles City (C. H.)	Custer	Rogers	Fergus
Millegan	Cascade	Ronan	Missoula
Milner	Fergus	Rosebud	Rosebud
Minden	Meagher	Rosemont	Ravalli
Miner	Park	Rothiemay	Fergus
Missoula (C. H.)	Missoula	Roundup	Yellowstone
Mitchell	Lewis and Clarke	Roy	Fergus
Mizpah	Custer	Sabra	Rosebud
Monarch	Cascade	Saco	Valley
Monida	Madison	Sadie	Custer
Montford	Flathead	Saint Mary ..	Teton
Moorhead	Custer	St. Ignatius	Missoula
Muir	Park	St. Pauls	Choteau
Musselshell	Yellowstone	St. Peters	Cascade
Nashua	Valley	St. Regis	Missoula
Neihart	Cascade	St. Xavier	Crow Reservation
New Chicago	Granite	Salesville	Gallatin
Newlon	Dawson	Saltese	Missoula
New Year....	Fergus	Sapphire	Fergus

Sand Cliffs	Choteau	Tobacco	Flathead
Sand Coulee	Cascade	Tokna	Dawson
Sandstone	Custer	Toston	Broadwater
Sandford	Dawson	Townsend (C. H.)	Broadwater
Saypo	Teton	Troy	Flathead
Scobey	Valley	Truly	Cascade
Sedan	Gallatin	Tusler	Custer
Selway	Custer	Twin Bridges	Madison
Sexton	Gallatin	Two Dot	Meagher
Shannon	Meagher	Ubet	Fergus
Shawmut	Meagher	Unity	Meagher
Shelby	Teton	Utica	Fergus
Sheldon	Flathead	Vermillion	Missoula
Sheridan	Madison	Victor	Ravalli
Shonkin	Choteau	Virgelle	Choteau
Smead	Missoula	Virginia City (C. H.)	Madison
Sidney	Dawson	Walkerville	Silver Bow
Silesia	Carbon	Warm Springs	Deer Lodge
Silver	Lewis and Clarke	Warrick	Choteau
Silver Bow	Silver Bow	Washington Gulch	Powell
Silver Star	Madison	Waterloo	Madison
Sixteen	Meagher	Watson	Meagher
Somers	Flathead	Weede	Fergus
South Butte	Silver Bow	Welch	Jefferson
Springdale	Park	Wetzel	Teton
Spring Hill	Gallatin	Whitehall	Jefferson
Stacey	Custer	Whites	Broadwater
Stanford	Fergus	White Sul. Springs (C. H.)	Meagher
Stark	Missoula	Whitlash	Choteau
Stearns	Lewis and Clarke	Whitney	Custer
Steele	Choteau	Wibaux	Dawson
Stevensville	Ravalli	Wickes	Jefferson
Stockett	Cascade	Wilder	Fergus
Stone	Granite	Willis	Beaverhead
Stuart	Deer Lodge	Willow Creek	Gallatin
Stryker	Flathead	Winnecook	Meagher
Sula	Ravalli	Winston	Broadwater
Sunnyside	Cascade	Wisdom	Beaverhead
Sun River	Cascade	Wolf Creek	Lewis and Clarke
Sunset	Powell	Wolf Point	Valley
Superior	Missoula	Wolsey	Meagher
Sweet Grass	Teton	Woodman	Missoula
Sylvanite	Flathead	Woodside	Ravalli
Teedee	Custer	Woodville	Jefferson
Terry	Custer	Woodworth	Powell
Teton	Choteau	Wormser	Sweet Grass
Thompson	Missoula	Yale	Fergus
Three Forks	Gallatin	York	Lewis and Clarke

AREA OF COUNTIES IN MONTANA IN SQUARE MILES.

Beaverhead	4,494	Madison	4,443
Broadwater	1,247	Meagher	4,253
Carbon	2,472	Missoula	6,385
Cascade	2,764	Park	2,788
Choteau	16,649	Ravalli	2,771
Custer (a)	20,490	Silver Bow	1,017
Dawson	13,227	Sweet Grass	2,887
Deer Lodge (b)	4,252	Teton	7,588
Fergus	8,928	Valley	13,868
Flathead	8,419	Yellowstone	3,710
Gallatin	2,583	Crow Indian reservation	5,475
Granite	1,543		
Jefferson	1,585	Total	145,310
Lewis and Clarke	2,572		

(a) Includes Rosebud.

(b) Includes Powell.

Note: Powell county is included in Deer Lodge and Rosebud county is included in Custer.

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